

# Research on the Innovative Development Path of Happy River in Zhejiang Province

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## Abstract

**Building a happy river for the benefit of the people is the new goal of river and lake management under the new situation, which is of great significance to ensure the health of rivers and lakes and the sustainable development of economy and society. This paper composes the connotation of happy river, initially constructs a comprehensive index system of happy river, conducts an in-depth analysis of the current problems of rivers and lakes in Zhejiang Province, and proposes an innovative development path of happy river and lake in the new period, which is of great significance to the healthy and sustainable development of rivers and lakes in Zhejiang Province.**

## Keywords

**Zhejiang Province; Happy River; Innovation Path.**

## 1. INTRODUCTION

General Secretary Xi Jinping first mentioned the great call to "build a happy river for the benefit of the people" at a symposium on ecological protection and high-quality development of the Yellow River basin in September 2019. The construction of happy river is the basic strategy of regional economic development and ecological civilization construction in the new era, and it is also the basic guarantee to improve people's sense of well-being, sense of access and sense of security. How to scientifically and accurately establish the comprehensive evaluation index system of happy river, and then reasonably determine the innovative development path of happy river and lake has become a hot topic in academic circles.

## 2. HAPPY RIVER CONNOTATION

Rivers and lakes are the lifeblood of human survival, the cradle of human civilization, and are closely related to the development of society. The new era of "happy river" has a certain subjective, dynamic and regional, its connotation has gone beyond the traditional healthy river and pure river ecological environment, combined with water ecology, water security, water environment, water resources, water protection, water culture, water industry, water management, water landscape and cultural education and other content. A happy river is a peaceful, healthy, livable, rich, cultural and harmonious river that can meet certain needs of human society on the basis of maintaining the stability of the river and lake ecosystem's own structure and function, and achieving the harmonious coexistence of human and water for the benefit of the people.

Happy rivers and lakes are defined in the China River and Lake Happiness Index Report as rivers and lakes that can maintain the integrity and fluidity of the water system structure, the diversity of biological communities, the stability of the regulation mechanism and the

satisfaction of the living environment under complex environmental influences, and can meet the requirements of drought and drainage as well as the requirements of dynamic balance and ecological integrity, and can also guarantee the reasonable requirements of sustainable human economic and social development and people's good life. The Code for the Construction of Happy Rivers and Lakes in Plain Areas elaborates the connotation of happy rivers and lakes, which are able to maintain their own health, support high-quality economic and social development in the watershed and region, reflect the harmony between people and water, and give the people in the watershed a high sense of security, access and satisfaction.

According to this paper, a happy river is a river that can maintain its own stability and health, support the high quality of regional and basin economic and social development, reflect the harmony between people and water, and give people in the basin a high sense of access, security, vitality, belonging, harmony and happiness, which is the collective name of "the river of peace, health, livability, wealth, ecology and harmony."

### **3. THE CONSTRUCTION OF COMPREHENSIVE EVALUATION INDEX SYSTEM OF HAPPY RIVER IN ZHEJIANG PROVINCE**

#### **3.1. Happy River Comprehensive Evaluation Index**

Scientific and reasonable construction of index system is the key to comprehensive evaluation of happy rivers and lakes, this paper refers to the evaluation specification of happy rivers and lakes in Hangzhou, Zhejiang Province, the local standard specification in Nanxun District, Huzhou City, the construction specification of happy rivers and lakes in plain areas and the evaluation specification of happy rivers in the Office of River Chief in Jiangsu Province and the evaluation specification of happy rivers in Nanjing, Jiangsu Province. On the basis of full investigation and research to establish the index system, it should include water security, water resources, water ecology, water environment, water culture, water economy and water management seven secondary indicators to represent the current situation of the eight major rivers in Zhejiang Province, and then decomposed into 29 tertiary indicators, the specific index system is shown in Table 1.

#### **3.2. Happy River Evaluation Criteria**

The indicator standard of Happy River is the main measure of the indicator level, and so far there is no unified standard for evaluating Happy River in Zhejiang Province. The determination of the standard value and the corresponding index level classification provided in this paper are based on the following information. (1) detailed consultation of experts in corresponding industries; (2) existing industry or national standards in similar evaluations; (3) target values of water resources, economic and social related systems and planning in relevant watersheds; (4) corresponding indicator standards in classical literature; therefore, the evaluation criteria of Happy River in Zhejiang Province can be divided into five levels, which are expressed in tables: very happy, relatively happy, average, not too happy and very unhappy, as shown in Table 1.

### **4. ANALYSIS OF THE CURRENT SITUATION OF RIVERS AND LAKES IN ZHEJIANG PROVINCE**

#### **(1) Gradual improvement of flood prevention and mitigation facilities**

In the new situation, flood control and security is the primary goal of the construction of the Happy River in Zhejiang Province, "river peace" is the common vision, to protect the normal order of life of the people is the basic requirement. Zhejiang is in the province's climate is more complex, high temperature and rain in the summer, the terrain from the southwest to the northeast, the topography is complex, composed of plains, basins, hills, mountains, islands,

**Table 1.** Evaluation indicators and standard values of Happy River

Level1 Indicator-s	Secondary indicators	Level 3 indicators	Grade Criteria					
			Very happy	happiness	general happiness	not very happy	Very unhappy	
Comprehensive Evaluation Index system of Happiness River	water security B1	Compliance rate of flood control projects C1	≥95%	[80%,95%)	[65%,80%)	[50%,65%)	<50%	
		Drainageproject compliance rate C2	≥95%	[80%,95%)	[65%,80%)	[50%,65%)	<50%	
		Safety rate of water conservancy project C3	≥97%	[90%,97%)	[75%,90%)	[60%,75%)	<60%	
		The penetration rate of the flood control channel C4	≥95%	[90%,95%)	[75%,90%)	[60%,75%)	<60%	
		River and Lake Conservation Index C5	≥85%	[70%,85%)	[55%,70%)	[40%,55%)	<40%	
	water resources B2	Utilization rate of water resources development C6	≥90%	[70%,90%)	[55%,70%)	[30%,55%)	<30%	
		Guarantee rate of water supply C7	≥90%	[80%,90%)	[70%,80%)	[60%,70%)	<60%	
		Effective utilization rate of farmland irrigation water C8	≥90%	[80%,90%)	[70%,80%)	[60%,70%)	<60%	
		total water use index C9	<0	[0,1%)	[1%,3%)	[3%,5%)	≥5%	
	water ecology B3	Ecological slope retention rate C10	≥90%	[75%,90%)	[55%,75%)	[40%,55%)	<40%	
		Shoreline Vegetation Coverage C11	≥75%	[50%,75%)	25%,50%)	[5%,25%)	<5%	
		biodiversity index C12	≥3	[2,3)	[1.5,2)	[1,1.5)	<1	
		water system connectivityC13	≥95%	[80%,95%)	[65%,80%)	[50%,65%)	<50%	
	Water Environment B4	Water and soil loss control rate C14	≥95%	[80%,95%)	[60%,80%)	[40%,60%)	<40%	
		Water quality compliance rate C15	≥95%	[85%,95%)	[60%,85%)	[20%,60%)	<20%	
		Hydrophilic convenience coverage C16	≥85%	[80%,85%)	[70%,80%)	[60%,70%)	<60%	
	water culture B5	Waterfront greenway coverage C17	≥95%	[65%,95%)	[30%,65%)	[10%,30%)	<10%	
		Degree of water culture excavation C18	≥95%	[80%,95%)	[60%,80%)	[30%,60%)	<30%	
		Effective protection rate of water cultural heritage C19	≥90%	[80%,90%)	[70%,80%)	[60%,70%)	<60%	
		Degree of education and publicity of water culture C20	≥95%	[80%,95%)	[50%,80%)	[20%,50%)	<20%	
	water economy B6	Node richness of water culture landscape C21	≥50%	[30%,50%)	[10%,30%)	(0%,10%)	0	
		Per capita GDP growth rate C22	>10%	(8%,10%]	(6%,8%]	(4%,6%]	≤4%	
		Proportion of Green Economy GDP	≥80%	[60%,80%)	[35%,60%)	[10%,35%)	<10%	
		Proportion of integrated water tourism products C24	≥50%	[40%,50%)	[30%,40%)	[20%,30%)	<20%	
	water management B7	public satisfaction C26	≥90%	[85%,90%)	[80%,85%)	[70%,80%)	<70%	
		River and lake digital platform application level C27	very high	high	generally	Low	not applied	
		The application degree of intelligent perception equipment C28	Apply 4 or more	Apply 3 items	Apply 2 items	Apply 1 items	not applied	
			Shoreline Utilization Management Inde C29	≥95%	[80%,95%)	[50%,80%)	[20%,50%)	<20%

prone to the formation of floods, flooding. However, flood control engineering system has been built in each watershed, but with the passage of time, some river embankments appear scouring, loosening and other phenomena; river silting, narrowing and other conditions generally exist in the river; equipment in the pumping station for many years of operation, there are more problems such as aging concrete, old and corroded equipment. For this reason, it is necessary to continuously improve flood mitigation facilities and scientifically regulate rain monitoring and early warning forecasting.

#### (2) Water allocation capacity needs to be improved

To a certain extent, high quality water resources can promote sustainable economic and social development. Zhejiang Province takes water to determine the city and water to determine demand as the standard, and "water conservation first" as the vision to coordinate ecological, production and living water needs, and basic water has been guaranteed accordingly, and rural drinking water problems have been solved, but the supply of high quality water resources. However, there are still problems such as insufficient supply of high-quality water resources, water quality shortage and wasteful use of water. For this reason it is necessary to continuously improve the utilization of water resources and improve water quality, which is important to promote the construction of water-saving socialism.

#### (3) The task of water ecology and environment is difficult

Water ecological environment is an important part of people's life, is the external representation of the river and lake, "ecological health" for the vision, the coordination of water system connectivity, water containment, ecological restoration, there is good water quality, but the rapid development of society has affected the balance of the river ditch waters, resulting in the degradation of water function, biodiversity decline, soil erosion, the existence of the water. Higher incidence of environmental pollution is more prominent, so it is necessary to continuously improve the water ecological environment along the river, to achieve the harmony between man and nature.

#### (4) Continuous strengthening and development of water culture

Water culture is an important element of water conservancy construction, water use, water conservation, water protection, love of water, water and other spiritual culture is an important part of China's traditional culture, the combination of water management and cultural heritage, fully explore the unique and rich water culture, strengthen the protection of water engineering heritage relics, to meet the needs of people's cultural life. But the Beijing-Hangzhou Canal, Zhejiang East Canal, Qiantang River and other regional cultural charm is not enough to play, the heritage of publicity, excavation and protection degree is not enough, the need to constantly strengthen the development of water culture, highlighting the local traditional history and culture, so that the happy river known as the spiritual and cultural ties of the people along the coast.

#### (5). Accelerate the cultivation of "water economy" industry

The construction of Happy River is integrated into the construction of rural revitalization, promoting common prosperity, creating a better life and realizing the vision of "prosperous industry and rich people, green development". However, at present, the integration of landscape, culture and tourism resources is not close, the diversification and specialization of urban and rural economy in the river basin needs to be broken through, and there are fewer ways to transform the benefits of river and lake management, etc. Bottlenecks need to be solved urgently, so it is necessary to continuously promote the deep integration and transformation of industries, collaborate with green development, promote multi-channel farmers' income generation and activate common wealth.

#### (6) Smart water conservancy construction needs breakthroughs

In the context of the rapid development of information technology such as big data, cloud computing, and artificial intelligence, "intelligent water protection" is the vision of water information development, is the concrete embodiment of modern water resources, is a new stage of water information development. But Zhejiang water wisdom management and the province's digital development standards there is a certain gap between the various departments of the information system excuse inconsistent, relatively difficult to integrate resources, the compatibility of information sharing needs to be improved, the whole line of water-related database information base needs to continue to strengthen the improvement, the use of "satellite remote sensing, video monitoring, unmanned aerial photography and other information technology to break through the construction of intelligent water conservancy Perfect.

## **5. THE INNOVATIVE DEVELOPMENT PATH OF HAPPY RIVER IN ZHEJIANG PROVINCE**

### **(1) River peace, improve the construction of flood control and water supply facilities**

Water safety is directly related to the safety of people's lives and property, is the basic guarantee of people's happiness. Therefore, the river needs to implement flood control and water supply improvement projects to ensure the long-term peace of the river, the implementation of the old sluice gates, pumping stations, demolition and reconstruction, to enhance the flood and drought control capacity; the development of relevant management system, the river bank collapse, loosening, scouring and other issues in a timely manner to implement the remediation, improve the rate of flood control standards; accelerate the construction of water supply projects and water diversion projects, to promote the protection of water sources cited to improve.

### **(2) Integration of "water resources, water environment, and water ecology" and coordinated governance**

The ecological health of rivers and lakes is the fundamental guarantee for the sustainable development of the economy and society, the virtuous cycle of the ecosystem, and the sustainable utilization of water resources. Strengthen the construction of ecological bank protection along the natural shoreline of the river, protect and restore the ecological resources of rivers and lakes, improve biological habitats, enrich animal and plant resources, increase the greening rate of river banks, realize "turning barren into green", and fundamentally solve the "four chaos problems" "; construct comprehensive leisure corridors such as water-friendly platforms and water-friendly pedestrian walkways, form a livable living corridor with distinctive features, high quality, and cultural connotations, realize "beautiful environment, facilities that benefit the people", and meet the needs of the people for a better life.

### **(3) Diversified integration of water engineering and water culture**

Combination of cultural heritage of river management, fully exploit the river and lake culture, promote the Grand Canal (Zhejiang) cultural belt, the development and construction of four poetry road cultural belt linkage integration, common construction and sharing. Green water conservancy project needs to be integrated into the history and culture, adhere to the regional culture, closely combined with the construction of urban and rural civilization, highlighting personalization, localization; clean government culture and water culture deep integration, promote water conservancy projects with "clean" brand; will be built into the river and lake to highlight the local history and culture, inheritance of local folklore, a new carrier to achieve "River civilization, spiritual home", to meet the growing needs of the people's cultural life. Reasonable and appropriate construction of water conservancy museums, water heritage parks, etc., can provide strong support for the protection of water cultural heritage.

(4) digital empowerment, strengthen intelligent water management

Intelligent water management is the inevitable development trend of water conservancy construction, can comprehensively improve the efficiency and effectiveness of water development. Relying on satellite remote sensing, video surveillance, unmanned aerial survey and other modern information technology, automatic detection and integration of water level, water quantity, water quality and other basic database. In-depth study of the digital twin technology of rivers and lakes, promote the river and lake basin flood control and scheduling, water ecological process regulation, water resources management and deployment and other functions of Wei Wei digital simulation technology; deepen the delineation of rivers and lakes, complete the delineation of the ecological space of rivers and lakes involving water, providing strong support for the province's ecological space involving water "one map" network management.

(5) Improve the management system and promote "sunshine water control"

Strictly implement the implementation of the river and lake system, improve the management and protection system of rivers and lakes, study the management mechanism of river basin words in the new era, accelerate the construction of river and lake basins to do their best to support the services of strong supervision. Relevant departments can combine traditional media and new media, using newspapers, television, microblogging, WeChat, brochures, banners and other forms to promote the happy river, the river system and other topics; strengthen the public's sense of participation and ownership, focus on public wisdom, the masses are "clairvoyant", play the role of the media and the masses of supervision. Smooth supervision channels to facilitate direct participation of the public in supervision and management. At the same time, regular online and offline public opinion surveys, around the water environment construction, water resources allocation, water security, water culture promotion, water ecological protection and other topics to prepare questionnaires, improve the reward and punishment mechanism, to stimulate the public to actively contribute.

## 6. CONCLUSION

The construction of the Happy River is the basic strategy for regional economic development and ecological civilization construction in the new era, and it is also the basic guarantee for improving the people's sense of happiness, gain and security. This paper sorts out the connotation of Happy River in detail, scientifically and rationally constructs a comprehensive evaluation index system for Happy River in Zhejiang Province, conducts an in-depth analysis of the current situation of rivers and lakes, and proposes an innovative development path for Happy Rivers and lakes in the new era. The healthy and sustainable development of rivers and lakes in Zhejiang Province is of great practical significance, and it can provide reference for the construction of happy rivers and lakes in other provinces.

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