

# Study on the Forming Process and Exploration of Concept of Human-Water Harmonization of Sustainable Development

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**Abstract.** According to Maslow's hierarchy of needs, the process of human development and utilization of water resources can be divided into three stages: engineering water conservancy, resource water conservancy and harmonious coexistence between man and water. These three stages reflect the transformation of the idea of human development and utilization of water resources and eventually reach the state of harmony between human being and water. At the same time, this article draws on the experiences of water management under the thinking of sustainable development in the United States, Western Europe, Northern Europe and Africa. Finally, this paper points out that we need to realize the harmonious coexistence between man and water and sustainable development of water resources in the process of development and utilization of water resources, which is the inevitable requirement of the economic and social development.

## 1. Introduction

Water harnessing is a kind of action, which takes place under the control of some kind of mind, and a natural law of all things born out of water. Whether it is ancient or modern, or both at home and abroad, all water-control actions will follow certain ideological concepts. According to the relevant theories of human desires, the desire of mankind for water is increasing, and the intensity of water control is also growing. As the human desire changes, the relationship between human and water also follows change. The relationship between people and water has changed from the harm of the past water on people to a man's harm to water. Maslow's hierarchy of needs theory is well-known in the ideology and philosophy of water resources management.

Maslow's hierarchy of needs theory holds that people realize their own self-development in the process of continuously satisfying the demand, and at the same time they also promote the progress of human society. According to the needs of the priorities, the demand can be divided into five levels, which includes physiological needs, safety needs, social needs, esteem needs, self-actualization needs. These five kinds of demand from low to high, according to the level of demand level by level. After the low-level demand is realized, the demand still exists, but it is no longer the main incentive factor. The next- high-level demand will replace it as the main driving force to encourage people's behavior. In this process, the enthusiasm of the people is fully mobilized, so they constantly engage in targeted and objective practice and constantly strive to meet the demand.

## 2. Multiple stages of harmonious sustainable development of human and water

According to Maslow's demand level theory, the process of human development and utilization of water resources can be divided into three stages (Figure 1). The first phase: Physiological and safety needs are the most basic needs of human survival and the lower level of demand, which correspond to



the stage of development and utilization of engineering water conservancy; the second stage: social and esteem needs are the need of man as a social individual, which beyond the instinctual needs of human biology and pay more attention to the quality of life, so these corresponds to the stage of development and utilization of resource water conservancy; the third stage: self-actualization is the highest levels of demand, which corresponds to the stage of development and utilization of harmonious coexistence between man and water.

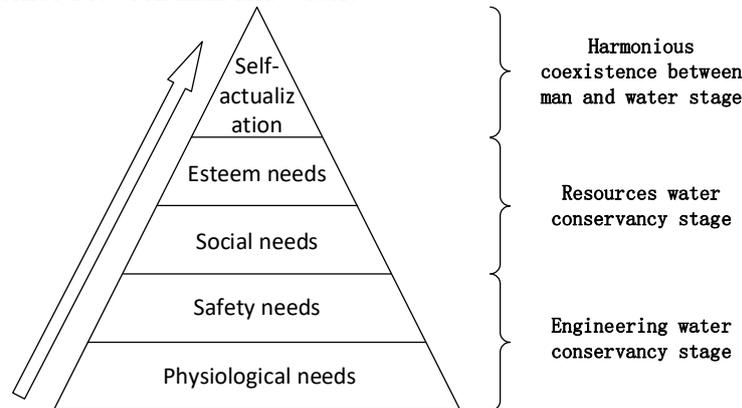


Figure 1. The process of development and utilization water resources under Maslow's demand theory.

### 2.1. Engineering water conservancy stage

Physiological and safety needs are the needs of human survival and stable development and the most basic and most satisfying needs of Maslow's hierarchy of needs, which primarily motive of human behavior. People develop and utilize water resources from the beginning to meet the physiological function. With the development of human civilization and the increase of population, in order to further ensure physiological and safety needs, people began to make some man-made modifications to the natural world, so that water resources could be developed to the benefit of mankind. With the deepening of transformation, engineering water conservancy was generated. The engineering water conservancy is mainly through engineering measures (such as dam power generation, water diversion irrigation and reinforcement of embankments etc.) to solve water resources development, utilization and governance issues in order to meet the social and economic development.

As a traditional agricultural country, as early as the emergence of farming, people started to construct simple water conservancy projects to ensure agricultural production. The construction of these simple measures changed the distribution of water resources to a certain extent not only enriched the connotation of water resources utilization but also improved people's living skills. But people were still passive in the face of water resources and often faced the threat of various water hazards. In recent years, with the continuous growth of the population and the city advancement, the demands for water resources expands rapidly, various aspects of social life and production have been restricted by water resources. Therefore, extensive and profound scientific research has been conducted on water resources and a large number of water conservancy projects had been constructed. These water conservancy projects are the activities of water resources development and utilization for people to ensure the safety of flood control and to solve the basic needs of water resources, which mainly through engineering measures.

### 2.2. Resources water conservancy stage

When physical and safety needs are met, the next level of social and esteem needs will show enough energy to motivate human behavior. This level of demand is not limited to being able to survive but to placing greater emphasis on the environment and quality of living and the value and meaning of living. In the course of developing and utilizing water resources, mankind firmly believes that man is the center and master of the world, and that all natural resources, including water resources, are only in

the interests of human beings. So people continue to increase the use of water and expand the scope of the use of water to meet the endless demand for water. However, in this process, people have neglected the ecosystem's demand for water and the water resource system's own carrying capacity and coupled with the unreasonable development impact on the social, environmental and ecological use of water resources, which cause the relationship between human and water resources are deteriorating. The phenomenon of frequent floods, water shortages, water pollution, soil erosion, groundwater level decline occurred frequently in the global scope, but also a serious threat to human safety and survival right.

In the process of rethinking the crisis, more attention has been paid to the sustainable use of water resources. Mankind began to examine the status quo and the future from the perspective of a member of nature rather than the ruler, and more profoundly understand that mankind's progress and development can not be separated without water. Only "respecting" water can ensure the sustainable development of mankind. In 1994, China formulated "China's Agenda 21 - China's White Paper on Population, Environment and Development in the 21st Century", which integrates economy, society, resources and environment into an integrated system and proposes strategies and measures for sustainable development. As a result, the concept of water resources development and utilization has been further perfected and has become more and more reasonable. Water conservancy development has also shifted from the engineering water conservancy stage to the resource water conservancy phase. Resources water conservancy stage aims at achieving sustainable utilization of water resources by optimizing the allocation of water resources and strengthening water resources management, which focus on improving the optimal allocation of water resources and the importance of resources and market allocation role and pay more attention to water resources allocation and management inputs, which including system construction and institutional innovation investment. At the same time, it pays more attention to the ecological value of water resources and environmental attributes.

### *2.3. Harmonious coexistence between man and water stage*

The need for self-fulfillment is the maximum of an individual to realize his ideal, to give full play to his own ability, and to the need for everything that is commensurate with his ability. This level of demand is a growing demand, is the individual's self-realization and self-transcendence. At this stage, all kinds of human capabilities can be given full and free play, and the internal and external of the individual are in a state of harmony.

The analysis of water resources development and utilization under Maslow's hierarchy of needs not only can well divide all stages of water resources development and utilization, but also point out the direction for human development and utilization of water resources in the future.

## **3. The attempt and exploration of water control in all countries in the world under the thinking of sustainable development**

Although the western developed capitalist countries suffered some failures in the history of water control, they later updated the concept of water control and carried out some successful attempts and explorations in water control.

### *3.1. America*

The United States is a distinctive country with a history of only 200 years since its founding in 1776. However, it has become the most developed country in the world. The United States is a federal system country, each state has considerable legislative power, so the relationship between state government and the federal government's is relatively loose. In accordance with the Decrees Enacted by the United States Congress, the three levels of the federal government, state government and local government agencies are all responsible for the management of water resources, which implements a management system based on state and local governments as the basic units.

The water treatment in the United States is supported by modern ideas and modern technology, and pays great attention to the overall planning of water resources. The state administrative functional

organization is mainly responsible for the national water resources planning, management, coordination and water pollution control, and determines the general management objectives and guidelines, and formulating policies, regulations and standards. The state and local administrative departments are responsible for the implementation of the country's general objectives and the specific indicators of the state and local areas. The United States belongs to a country ruled by law and doing things in accordance with the law is the basic principle and has strictly implemented the planned water resources that have been formulated.

### *3.2. Western European countries*

Western European countries, represented by the old capitalist countries such as Germany, France and Britain, have also undergone many measures and gradually improved in the development process. As the industrialization of these Western European countries started earlier and the rapid industrialization developed, the demand for water resources has been greatly raised, resulting in excessive seizure of water resources and serious damage. Later, these countries self-aware of hazards and gradually integrated management of water resources, such as pollution control, restoration of natural river ecology. During this period, the famous countries in the Alps area (Germany, Switzerland and Austria) started the "near natural river regulation" project in 1980s. These countries have formulated river management programs that focus on the overall function of river ecosystems and the role of rivers in restricting and interacting with each other in plant distribution, animal migration and ecological processes in a three-dimensional space, and it focuses on the role of rivers as ecological landscapes and gene banks. At present, after nearly 30 years of hard work, the project of "near natural river management" has brought about a significant increase of biodiversity within the basin, an increase of biological productivity, and a multiplication and density of biological populations.

The International Committee of Rhine Protection (ICPR), established in 1950, proposed the Rhine Action Plan in 1987, emphasizing the ecological restoration as the main index of reconstruction of the Rhine, with the main target being the return of the salmon to the Rhine by the year 2000, so this river's long term planning named "Salmon-2000 Program". The plan puts forward the conditions to restore the biome to the Rhine and its tributaries, and the general goal of governance is to turn the Rhine into "a backbone of a complete ecosystem". Coastal countries have invested tens of billions of dollars in pollution control and ecosystem construction. By the year 2000, the Rhine River has fully achieved its target. The forests along the river are dense with wetland development and the water quality is clear and clean. Salmon have migrated upstream from the estuary - spawning in Switzerland, other animals such as fish, birds and amphibians have also returned to the Rhine.

### *3.3. Nordic countries*

In the Nordic countries, represented by Poland and Denmark, their water control model adopts a purely ecological treatment model. The Nordic countries belong to the frigid climate and the temperate marine climate that are very different from our monsoon climate. Their annual precipitation is more homogeneous, and their water resources development and utilization is relatively difficult. Therefore, the Nordic countries do not advocate the excessive construction of water conservancy projects, but they pursue a state of near nature.

### *3.4. African countries*

Water resources in the African continent are very scarce, but the country that is more successful in water treatment is South Africa. Due to the limitation of economic conditions, South Africa's water control has adopted a breakthrough and step by step way to invest limited funds in specific projects, especially in urban water supply. They seek to govern one place and succeed one place.

## **4. The consciousness and understanding of the concept of man-water harmonization in China**

In the early days after the founding of New China, influenced by the revolutionary enthusiasm and species conditions of the time, the thought of "Man can conquer nature" and other ideas of nature

transformation prevailed for a long time. In August 12, 1966, the Communist Party of China issued a call in the communique to the whole nation: “Learn from Daqing in Industry, Learn from Dazhai in Agricultural, All National People Learning from the PLA man and Strengthen Political and Ideological Work”, since then, the campaign of “Learn from Dazhai in Agricultural” began. The construction of water conservancy has become an important part of “Learn from Dazhai in Agricultural” all over the country, which scale and investment have been continuously expanded, and the results have gradually come into effect. By 1977, nearly 100 artificial river courses and more than 70,000 artificial reservoirs were excavated and built throughout the country. By 1978, the country's farmland irrigated area reached 800 million Mu, an increase of 60% over 1965. It can not be denied that the water conservancy construction at that time played an important role in promoting social and economic development and also had a widespread and profound impact on the concept of modern watercraft in China. It now appears that the then flood control concept severely damaged the ecosystem and the natural environment, creating a situation where there are mountains and rivers and rivers. Now it seems that the idea of water treatment at that time seriously damaged the ecological system and the natural environment, and caused the situation that the mountain is all soil and the river is dry.

In the subsequent development, we gradually realize that it is not worth to develop the economy at the expense of resources and the environment. In 2007, the idea of “The Scientific Outlook on Development” was put forward in the Seventeenth National Congress of the Communist Party of China, which takes development as its essence, putting people first as its core, comprehensive, balanced and sustainable development as its basic requirement, and overall consideration as its fundamental approach. In the development of water resources, the realization of “man-water harmonization” is required, which is the inevitable requirement of economic and social development and the sublimation of human understanding of the natural law. It is also the core idea of solving the water problem and water crisis and the embodiment of Scientific Outlook on Development's work in water conservancy.

In 2012, President Xi put forward the great strategic plan of building ecological civilization at the Seventeenth National Congress of the Communist Party of China. He pointed out that building an ecological civilization is a great plan that concerns people's well-being and concerns the future of the nation. It is also an important part of realizing the great dream of great rejuvenation of the Chinese nation. In terms of environmental protection and water resources utilization, on September 7, 2013, President Xi addressed a speech at the Nazarbayev University in Kazakhstan and replied to questions raised by the students. He pointed out: “Lucid waters and lush mountains are invaluable assets”. This vivid image expresses the clear attitude and determination of our party and the government to vigorously promote the construction of ecological civilization.

At the 19th National Congress of the Communist Party of China, President Xi proposes “Ensuring harmony between human and nature”. Building an ecological civilization is vital to sustain the Chinese nation's development. We must realize that lucid waters and lush mountains are invaluable assets and act on this understanding, implement our fundamental national policy of conserving resources and protecting the environment, and cherish the environment as we cherish our own lives to create good working and living environments for our people and play our part in ensuring global ecological security.

Therefore, we pursue the harmony between human and lucid waters and lush mountains, which is our guiding principle for the future development and utilization and protection of water resources. We should follow the basic concept of respecting nature, conforming to nature and protecting nature, implement the basic national policy of conserving resources and protecting the environment, and integrate ecological civilization construction into all aspects and processes of economic construction, political construction, cultural construction and social construction so as to build a beautiful China and make efforts To a new era of socialist ecological civilization.

## 5. Conclusion

According to Maslow's hierarchy of needs, the development and utilization of water resources have gone through the water resources from engineering water to resources water stage, and then to the stage of harmonious coexistence between man and water, which This not only adapts to changes in the Relationship between humans and water, but also reflecting changes in the concept of human development and utilization of water resources. At present China has entered the new normal stage of economic and social development. We should follow the requirements of the development of the new era and the basic concept of respecting nature, conforming to nature and protecting nature when we develop and utilize water resources and ultimately achieving peace development of human and water. This is what we are doing now, but it can benefit the future generations.

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