

# Representation of Water Treatment Technology in Paolo Bacigalupi's *The Water Knife*

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## Abstract

In the cli-fi novel *The Water Knife*, Paolo Bacigalupi depicts a world in the near future where droughts are rampant. In the novel, people make great efforts in the recycling of water resources and use a variety of technologies to obtain water for survival. This article focuses on the depiction of water treatment and production technologies in *The Water Knife*, connects it with existing technologies in the real world, and indicates the significance of these technologies in future application .

## Keywords

Climate Fiction; Paolo Bacigalupi; *The Water Knife*; Water Treatment Technology.

## 1. Introduction

Climate fiction has been developing vigorously in the 21st century when environmental problems are becoming increasingly prominent, and has become a unique literary genre. The American writer Paolo Bacigalupi is an important figure in the group of climate fiction creators. In April 2012, in an interview with Caroline Juras, Bacigalupi stated that his works adopt the creative logic of science fiction, which is "to focus on reality and think about what the future will be like if this specific trend continues". [1]

Perhaps it is because of following this logic that the fragmented and cruel future presented by Bacigalupi in his novel is so real that it even brings worry and fear to readers. At the same time, we can also obtain a unique new perspective for thinking about the real - world water crisis and technical solutions by analyzing the sci - tech depiction and technological imagination in Bacigalupi's works, and strive to draw inspiration from the sci - fi settings to cope with real challenges. *The Water Knife* covers an extensive range of technologies for water resource management and control, describing everything from household water filtration devices to large-scale, comprehensive purification systems. This article will focus primarily on the book's descriptions of technologies for treating produced water resources. By connecting these descriptions to existing real-world technologies, we will attempt to analyze their underlying principles and practical applications.

## 2. The Background and Underlying Logic of the Sci - Tech Depiction

The inspiration for *The Water Knife* comes from the real - world problem of decreasing water resources. The novel is set against the background of climate change and drought in the southwestern United States, focusing on the conflict between Phoenix and Las Vegas over water rights. In a world plagued by droughts and desolation everywhere, people rely on various technologies (such as the centrifugal pumps described in the novel that allow Nebraska, Kansas, Oklahoma and Texas to draw water from aquifers) [2]to obtain water sources. However, the development of technology has instead aggravated the deterioration of the human living environment. When the water accumulated in the aquifers is squandered, human beings will have no second chance. Bacigalupi pays close attention to real-world problems and portrays a near-future world transformed by the extreme consequences of climate change, genetic

engineering, floods, droughts and poisons. Although Bacigalupi calls himself a "technophobe" who fears the improper use of technology and the serious consequences of extreme development, and is committed to developing the world in his book in this direction, he also leaves a glimmer of hope in the text to prevent human beings from falling into complete despair. Readers can find some methods and clues to avoid the gloomy future from his description of water resources and technological imagination. [3]

In order to make the entire background setting convincing, Bacigalupi leaves scattered descriptions of water recycling and treatment technologies in the text: starting from the well-operated water purification system designed by the Chinese, which is only mentioned by the characters at the beginning; to ClearSacs, the water filter bag that can filter urine into drinkable water. These treatment methods of different levels and scales all aim to obtain water in the end. In the context of scarce water resources, the awareness of grasping and properly treating the existing water resources has penetrated into the daily life of every character in the novel, and is realized through the corresponding sci-tech depiction in the text, allowing the characters to have a glimmer of hope for survival in the arid world despite the hardships.

### 3. Water Treatment Technology in *The Water Knife*

The more specific water treatment devices presented in *The Water Knife* are mainly the water filter bags and the recycling system in Taiyang Special Zone. This part will sort out the descriptive sentences about these two devices in the book respectively and conduct corresponding analysis.

#### (1) Daily Life Treatment Device: Water Filter Bags "ClearSacs"

Water filter bags have been applied in real life nowadays, and the water they purify is mostly seawater, river water, etc. However, in the world of *The Water Knife*, the only accessible and usable water source for people is their own urine. Even though they have a lot of complaints, all they can do is complain on social media topics: "How to know you've hit rock bottom: when you drink your own urine and tell yourself it's mineral water. #PhoenixDowntheTubes #ClearSacsLove".

Maria couldn't stand the dry toilet, so she had to use a ClearSacs to solve her physiological needs in Arizona, where red rocks are everywhere. [4] "She pulled up her shorts and hurried out, carrying the half-full ClearSacs, glad to be able to be back out in dawn's open smoky air again". When the landlord asked for water as rent, Maria held up the water filter bag and said, "Once I squeeze it, it turns into water". There may be an exaggeration of the working efficiency of the water filter bag in this statement, but it also allows people to get a glimpse of the working method of this daily water treatment system.

It is understandable that people have a lot of complaints about water filter bags, ClearSacs, but it is undeniable that the existence of water filter bags has played a significant role in helping them survive in the water-scarce environment. At the same time, the application of ClearSacs also reflects the vitality and subjective initiative of human beings. Although the theory that "man can conquer nature" is not applicable in the face of an invincible environment, human beings can independently choose to use water filter bags based on their experience to provide a certain source of water for their subsequent survival. [5]

#### (2) Water Circulation System Reflecting Oriental Philosophy

Many scholars have already analyzed the image of China in the book: in *The Water Knife*, Bacigalupi regards China as a model to save the picture of the climate doomsday. China provides advanced science and technology and infrastructure to alleviate the water shortage problem for the cities in the southwestern United States, actively helps them with climate governance, funds solar energy projects, builds ecologically comfortable special zones such as "Taiyang Special Zone" and "Cypress Special Zone" as well as disaster-resistant buildings, constructs

large - scale vertical farms, and joins hands with the Red Cross to donate friendly pumps. These efforts enable the elite class such as the rich to survive in California and Nevada, where sandstorms are rampant and water sources are scarce. Thus, a powerful image of China leaps off the page. [6]

The author also describes the water circulation system designed by the Chinese through the mouth of Tumey, Maria's friend:

Figure out how to balance all the plants and animals, how to clean up the waste and turn it into fertilizer they can use in their greenhouses, how to clean the water, too. You run black water down through filters and mushrooms and reeds and let it into lily ponds and crap farms and snail beds, and by the time it comes out the other end, that water, it's cleaner than what they pump up from underground. Nature does all the work, all the different little animals working together, like gears fitted inside an engine. Its own kind of machine. A whole big living machine. (p.91)

The closed-loop water system depicted in this passage profoundly reflects the Oriental philosophy of "harmony between man and nature" and "following the way of nature". [7] Instead of using human power to interfere by force, it imitates the symbiotic wisdom of nature and regards animals and plants as an integral part of an organic whole, just like a precise but vibrant "living machine". The water circulation process is particularly typical: it does not rely on industrial purification, but uses the natural decomposition capacity of organisms such as mushrooms and reeds, as well as the step - by - step filtration and absorption of lotus ponds, crabs and snails to complete the purification of water and the circulation of nutrients. This imitates the natural wetland ecology, emphasizes the interdependence, transformation and balance of all things, and finally gives new life to the sewage, making it even cleaner. It demonstrates the natural law of circulation and endless life in Oriental thought, as well as the respect for and skillful use of the inherent value of all things.

#### 4. Practical Significance and Application Value in the Sci - Tech Depiction

It is often said that art comes from life, and the ultimate goal of analyzing the hidden practical significance in works is to provide inspiration and guidance for human life in the future. Nowadays, the development of water filter bags is relatively mature. As the name suggests, their main working method is a kind of "filtration" - using a specially made "filter paper" with a specific pore size range to allow water molecules and small molecular substances to pass through smoothly, thereby realizing the purification and separation of water. [8] In recent years, with the continuous progress of materials science and membrane manufacturing technology, ultrafiltration membrane technology has been increasingly widely used in drinking water treatment, industrial wastewater treatment, domestic sewage treatment and other fields.

Although the water circulation system described by Bacigalupi has no similar application in reality, there are traces to follow. Thousands of years ago, farmers in China created an efficient artificial ecosystem of "mulberry trees planted on pond ridges, mulberry leaves fed to silkworms, silkworm excrement used to feed fish, fish manure used to fertilize the pond, and pond mud used to fertilize mulberry trees" in order to make full use of the land.

The water circulation system in *The Water Knife* should be created and improved by Bacigalupi based on his research on the East. This sci - tech depiction provides a highly sustainable natural solution to the environmental and resource challenges faced by human beings today. [9] This system imitates and enhances the purification function of natural wetlands, providing an ecological path for wastewater treatment. It not only purifies the water body, but also creates

a new ecological environment (wetlands, ponds) in the process, improves biodiversity, and realizes the upgrade from "treating pollution" to "creating ecology".

At the same time, this also represents a transformation in the mode of development—from the industrial thinking of pursuing the conquest of nature and mechanical efficiency to the ecological thinking of seeking cooperation with nature and imitating the wisdom of nature. This is not only a technological innovation, but also the practical practice of philosophical concepts. It proves that human activities can be a part of the ecological cycle rather than a burden on the ecology, thus realizing the harmonious unity of development and environmental protection in the true sense. [10]

## 5. Conclusion

In short, *The Water Knife* not only tells a story about survival and water resources in an arid future world, but also serves as a window for us to peek into the future and shows a somewhat desperate possibility. While sounding the alarm for people today, Bacigalupi also hides clues for change in the book and provides inspiration for human development through sci - tech depiction.

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