

An Analysis of the Protection and Inheritance of Intangible Cultural Heritage from the Perspective of Cultural and Creative Industries: A Case Study on the "Huojing" in Bashu

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Abstract: Taking the Intangible Cultural Heritage of the "Huojing" in Bashu as an example, this article discusses the protection and inheritance of intangible cultural heritage under the perspective of cultural and creative industries. Intangible cultural heritage is a product of the agricultural civilization era, which is currently incompatible in the era of high-speed development of the Internet and digital economy, leading to difficulties in its protection and inheritance. Cultural and creative industries are emerging industries in modern times, which integrate with other industries through unique innovative forms and operational methods. It is particularly important to fully tap cultural resources and transform them into a source of creative industry to enhance competitiveness. Intangible cultural heritage provides cultural materials and creative sources for the cultural and creative industries. In turn, the cultural and creative industries bring unprecedented development opportunities to intangible cultural heritage, promoting economic benefits, providing innovative mechanisms, and a platform for integration into modern society.

1. Introduction

The earliest known written record of the "Huojing" dates back to the Han Dynasty in China. The ancient Shu people used this traditional handicraft and intangible cultural heritage skill to dig wells for salt and cook with natural gas, as well as to smelt metals. This was a great cultural achievement of the Shu people in terms of cultural transmission and innovation. In today's technologically advanced society, this emblematic symbol of BaShu culture deserves our attention for further research, protection, and inheritance. This article will use the cultural heritage of the "Huojing" in Linchuan as a background, and the earliest recorded use of natural gas for production and daily activities in the BaShu "Huojing" culture as a case study. By combining intangible cultural heritage with cultural creativity, the article will analyze how to enhance the expansion of intangible cultural heritage, explore how to broaden the path of inheritance, and extract how to integrate traditional forms with modern resonance, integration and advancement. This article will also explore the path to further active protection of intangible cultural heritage through market orientation, re-creation, and re-invention.

2. The "Huojing" in Bashu is an important cultural heritage.

2.1 The historical value of the "Huojing" in Bashu.

The recorded history of the "Huojing" in Bashu refers to the burning phenomenon of natural gas wells in ancient texts. The term "Huojing" actually refers to a general term for a cluster of wells, which includes not only simple gas wells, but also wells that extract both water and gas or oil and gas. The ancient Chinese technique of deep well excavation was applied, mainly for the extraction of brine water or salt wells. Later, the development progressed to include the extraction of natural gas, known as "Huojing." The history of "Huojing" can be traced back to at least the Han Dynasty. In the Western Han Dynasty, the "Huojing" in Linqiong were used to produce salt, which is the earliest record of natural gas development and utilization in the world. According to historical documentation on the development of science and technology, the earliest recorded use of natural gas occurred in England in 1668, but "Huojing" preceded it by more than 1600 years.

Mr. Ren Naiqiang, the master of the collection of Huayang Guozhi, said in the "Annotations to the Huayang Guozhi School": "(Linqiong) Huojing field, in the second century BC there was a Huojing. Those who built salt wells in Pichi dug out natural gas. This

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shows that 2,000 years ago, natural gas was already available in China's Bashu region, and the historical documents containing this scientific miracle are very precious. [5] "Second century BC" and "2,000 years ago" refer to the time period of the Qin and Han dynasties, and Sichuan in the Qin Dynasty probably already had a "Huoqing". According to Zhang Hua's "Natural History" of the Western Jin Dynasty: "There is a Huoqing in Linqiong, five feet in width, two or three feet deep, and the well is in the south of the county, and in the past, people used bamboo and wood to throw fire. Zhuge Prime Minister looked at each other, and the fire turned stronger. Hold the pot and cover the well, boil salt to get salt. The fire was extinguished when it entered the house, and it will not be burned again. " [4] With the deep gouging of salt wells, natural gas buried in the ground with abundant content is naturally developed and utilized. Jin Ren Zuo Si's "Shudufu" has the sentence "The Huoqing sinks in the dark spring, and the high smoke flies in the sky", which is the ancients' deliberate description of the Sichuan Huoqing, which shows the prosperity of the Huoqing in those years.

Yang Xiong, a native of Chengdu, was a leading figure in the national academic community during the late Western Han Dynasty. During the Yongshi period of Emperor Chengdi of Han (16-15 BCE), he wrote the "Shudu Fu," which includes the phrase "Tongliang Jintang, Huoqing Longqiu." The term "Huoqing" in this context refers to the Huoqing town in Qionglai today. According to Liu Liang, a Tang dynasty scholar who annotated the "Shudu Fu," "There is a Huoqing in Shudu, located southwest of Linyou County. Huoqing also refers to salt wells. To light the Huoqing, people first use household fire. After a moment, there is a rumbling sound like thunder, and it bursts into the sky with a radiance of ten miles. They then use a bamboo tube to collect the light without any charcoal." This passage suggests that during the Western Han period, people in Chengdu had already begun using natural resources, such as the natural gas from Huoqing, to boil the brine from salt wells. This was a remarkable feat of ancient technology by the Shu people. Furthermore, numerous salt well paintings have been unearthed from Eastern Han tombs in Chengdu, such as the Yangzishan in 1954 and Huapaifang in Qionglai in 2014. These paintings vividly depict the widespread and busy scene of boiling salt using Huoqing during that period. It is true that the "Huoqing" of Huoqing town was already in existence during the Western Han period, and it is not a mere falsehood that the town boasts the "world's first well." From this origin, in the Sichuan region, numerous well groups, gas wells, oil gas wells, and salt wells have subsequently developed.

2.2 Intangible Cultural Heritage in the "Huoqing" Culture of Bashu

The Sichuan Basin was an inland lake millions of years ago, and large amounts of saltwater and natural gas are still stored underground. Sichuan was the earliest region in China to excavate salt wells. The "Huoqing" cultural

heritage in the Sichuan-Chongqing region refers to the exploration, excavation and utilization of wells, and includes the application of multiple intangible cultural heritage technologies. Dr. Joseph Needham of the UK believes that China was not only the first country in the world to develop natural gas, but also that the drilling and excavation techniques used in oil exploration today are definitely inventions of the Chinese, with much evidence to support its use as early as the first century BC to the first century AD in Linchuan, Sichuan. According to "The Chronicles of Huayang • Chronicles of Shu," Li Bing, who served as the Governor of Shu in the period of Emperor Xiaowen of the Qin Dynasty (around 250 BC), "recognized the water veins of Qi, bored salt wells in Guangdu, and various reservoirs and ponds. Shu then flourished with abundant health." "In the third year of Emperor Xiaoxuan's reign, the Wenshan commandery was abolished and a northern military commander was appointed. Twenty salt wells were then dug in Linchuan and Pujiang, and salt-iron officials were added." "The Chronicles of Huayang" records Linchuan County: two hundred miles southwest of the county. Originally inhabited by the Qiang people, they were relocated to Shang County by Emperor Qin Shihuang. There is the Bu Pu River, which joins the Huoqing River. There is the Huoqing, whose light shines up to the sky at night. The people were fond of the light, and threw their home fires into it. The flames roared for a while, and the fire burned for dozens of miles. The gas was contained in bamboo tubes and pulled for a whole day without going out. The well has two types of water. When the well water is boiled with the fire, one bucket of water can produce five dou of salt. When boiled with household fire, there is not much salt produced. There is an ancient Shishan mountain and a stone mine, with stones the size of garlic. When the stones are burned, they become flowing cast iron, which is very strong. An iron official was appointed as a result. There is an ancestral temple for iron, and during the reign of Emperor Wen of the Han Dynasty, copper and iron mountains were given to Deng Tong, a minister. Deng borrowed money from the wealthy Zuo Wangsun and received a thousand horses a year. Therefore, Wangsun's fortune accumulated to billions, while Deng's money was spread throughout the country. Wangsun's daughter, Wenjun, could play the qin. At that time, there was a minister named Sima Changqing, who visited Wangsun's house with the county magistrate Wang Ji. Wenjun then eloped with Changqing. During the Han Dynasty, the county residents Chen Li served in Ba commandery, Zangke, and Tianshui as the governor with unique governance. The Chen and Zheng families are also known for their large families.

At the end of the war, a number of wells, including the "Guangdu Salt Well" in Western Shu, were successfully drilled, and their application served as a precursor to the modern large-scale development and utilization of oil and natural gas, occupying an important position in the history of new energy utilization in the world. Looking back at Su Shi's record of the production process of the Zhuotong well in the "Shu Salt

Commentary", "Hewn with round-edged chisels like a bowl, and several tens of Zhang deep; with giant bamboo to remove the knots, male and female ends connect to form a well, and with a brine barrier to separate the fresh water, the saltwater spring rises up." It has been verified that the drilling technology of the Zhuotong well was more than 800 years earlier than that of the West. The drilling technology of the Zhuotong well is also recognized as the "father of world oil drilling" and is hailed as the "fifth great invention of ancient China." The invention of this drilling technology not only greatly improved the level of salt production, but more importantly, during the process of mining brine, humans discovered the deep-buried oil and gas resources, which opened a brand new page for the world energy revolution. The Zhuotong wells in various salt areas of Sichuan include salt wells, oil wells, and water-oil wells. The production technology of the Zigong well salt deep drilling and extraction (traditional production technology of the Zigong well salt) is one of the intangible cultural heritage projects in China. It includes drilling design procedures, pre-drilling preparations, drilling, repairing, salvaging, gas-brine identification, and displaying premonitory signs of gas-brine resources during drilling, ultimately forming a deep salt well. Therefore, technologies such as Li Bing's large mouth well salt drilling technology, well salt production technology, Zhu Wangsun's metal smelting technology during Emperor Hanwen's reign, and the well salt technology of the Zhuotong well invented in the Northern Song Dynasty, which involve drilling tools, drilling equipment, clear hole tools, salvage tools, and sweep hole tools... the development and use technologies of these hundreds of types of equipment are all classified as intangible cultural heritage projects in the "Huojing" culture of Bashu.

2.3 Examining the Current State of the Intangible Cultural Heritage Protection and Inheritance through the Perspective of the Ancient Town of Huojingg.

Based on the above data and analysis, it can be concluded that the Huojingg Cultural Heritage and the ancient town of Huojingg where it is located is recognized as the earliest place in the world to discover and use natural gas. This is a town with both cultural history and technology. The ancient town of Huojingg was founded during the Northern and Southern Dynasties period of the Northern Zhou dynasty (557-581 AD), with a county history dating back to 689 AD. It is a civilization ancient town with a history of nearly 1500 years. Today, several local households in the ancient town continue to use the traditional method of transporting natural gas through bamboo pipes to boil water, cook food, and make rice. In the nearby cornfields of residents' homes, there are still large stone jars measuring two meters square covered with a diameter of more than one meter, large wooden barrels with a diameter and height of more than one meter, and large iron pots with a diameter of nearly two meters, which are

used for separating saltwater and natural gas. The technology process of using fire to boil salt from wells in Huojingg Town 2000 years ago is reenacted. Many of these unknown and neglected intangible cultural heritages that are on the verge of being lost are precisely found in the folk. They are so low-key that their existence is almost imperceptible, but their historical and cultural connotations far exceed many famous ancient towns.

Currently, the spread and protection of intangible cultural heritage (ICH) in different regions of China exhibit uneven development, and this issue is also prominent in the Bashu region where the "Huojing" ICH culture is situated. Some of the factors contributing to this imbalance include the uneven development of tourism in different areas, unequal approval rates of ICH projects, and uneven dissemination pathways for ICH platforms. Among these factors are examples such as the "Zigong brine deep drilling and pumping technology," which has been listed in China's National List of Intangible Cultural Heritage, and the establishment of Zigong Salt Industry Historical Museum, as well as attractions such as the Zhoutongjing Site Park in Da Ying County, which has been rated as a 3A national tourist attraction. However, there are still underdeveloped sites such as the deserted Lincang "Huojing" ancient town, the Baiyun Salt Well Site, and the Chengdu Ancient Salt Well Site. Taking Chengdu's ancient town as an example, incomplete statistics have shown that people's enthusiasm for the town is as high as it is for Sichuan hot pot. Chengdu's ancient town attracts those who appreciate the nostalgic atmosphere and tranquility of life. Apart from the Huanglongxi, Luodai, Anren Shuguo area, there are over twenty small and large ancient towns in Chengdu. The following table shows the real-time ranking of visitor traffic in Chengdu's ancient town attractions, (data taken from the internet):

Table 1: Ranking Table of Real-time Visitor Traffic in Chengdu Ancient Town Scenic Spots that are Captured in Real-time.

Ranking	Name	Footfall index	Traffic congestion index
2	Kuanzhai Alley Ancient Street Quarter	8.02	2.189
4	Jiezi Ancient Town	7	5.859
8	Pingle Ancient Town	6.2	9.393
10	Jinli Street	4.52	3.2
12	Luodai Ancient Town Scenic Area	4.08	1.186
13	Sandaoyan Scenic Area Ancient Town	3.97	2.519

18	Wenshu Monastery Ancient District	2.72	4.053
21	Huanglongxi Ancient Town	18.67	6.451
35	Dayi Liu's Manor Ancient Town	0.44	1.412
40	Luodai Ancient Town	0.02	1.211

Based on real-time data, it is evident that the public has a high degree of affection towards ancient town scenic spots. However, some hidden gems like Huojingg Ancient Town did not appear in the ranking. Should these undiscovered ancient towns be neglected? Of course not. However, with the increasing number of ancient towns, the issue of homogenization arises. The inherent image of ancient towns in China, the superficial indulgence in food, drink and entertainment, and the thousands of years of historical charm are still unknown to many. To protect and inherit intangible cultural heritage in the future and to seek differentiation in the development of ancient town tourist sites, new development models need to be pursued, and individualized survival principles found. How can we use the new innovative and inheritable ways of cultural and creative industries to carry forward the less popular intangible cultural heritage and make the cultural phenomenon of "Huojing" in Bashu "a hot spot"?"

3.The mutual value exploration between cultural creativity and intangible cultural heritage.

3.1 The Significance of Cultural and Creative Industry Development of Intangible Cultural Heritage

Intangible cultural heritage is a brilliant achievement that has been accumulated and created through the long history of various peoples and ethnic groups in their life and production practices, and has been passed down from generation to generation. It is the cultural imprint and wisdom crystallization of a nation. The exquisite traditional skills, profound ethnic thinking, and unique cultural genes contained in intangible cultural heritage are exactly what is lacking in the current period of globalization homogenization. However, intangible cultural heritage is a product of the agricultural civilization era. Although it has re-entered human vision, it seems incompatible with modern economic and social development, and its development and inheritance have encountered obstacles and difficulties. Since the rise of the cultural and creative industry, it has influenced the economic and cultural development of many countries and regions in the wave of globalization, and has a wide and complex connection with other industries in unique forms and operating methods. Culture is the cornerstone

and carrier of the cultural and creative industry, and is a valuable resource that precipitates unique cultural heritage. It is necessary to fully tap cultural resources and transform them into the power source of creative industries to improve their competitiveness. Intangible cultural heritage provides cultural materials and creative sources for the cultural and creative industry. The cultural and creative industry also brings unprecedented development opportunities for intangible cultural heritage, providing it with innovative mechanisms and platforms for integration into modern society.

By combining the two, the creative value of intangible cultural heritage can be explored and transformed into creative capital, not only enhancing the competitiveness of the cultural and creative industries, but also endowing the intangible cultural heritage with new vitality. Today, people are beginning to value cultural creativity, and the value of local culture is gradually being excavated. The "Huojing" culture, which has an important historical status in the BaShu region, can serve as a new carrier for the protection and inheritance of Chengdu's non-heritage culture. While emphasizing the protection of the non-heritage industry, innovations in cultural inheritance can also be made, achieving the goal of "serving Chengdu, and Chengdu serving" local cultural and creative industries, thereby increasing opportunities for integrated development and economic growth. Against the backdrop of the world cultural industry environment, various industries are now turning their attention to the research and development of cultural and creative products to better spread and promote the influence of the "Huojing" non-heritage culture. Through data analysis and research, it has been discovered that there are almost no "Huojing" cultural and creative products, and similar cultural and creative products related to Zigong Salt Well, the Dahua Zhoutong Well, etc. are also relatively rare. The key issue is that they fail to meet the needs and demands of contemporary consumers. In the future, in order to explore new directions for the innovative inheritance of "Huojing" non-heritage culture, cultural and creative products in the BaShu culture should focus on expressing cultural and storytelling elements in their content, while incorporating modern fashion elements, increasing innovation, practicality, experience, and enjoyment in their design, and catering to the needs of the public, more effectively developing cultural and creative products that meet market demand.

3.2 The development path of the cultural and creative industry of the 'Huojing' of Bashu.

3.2.1 Concept for cultural and tourism industry development incorporating the "Huojing" symbol

The fusion of cultural heritage with creativity as its core is a wonderful way to protect intangible cultural heritage in a dynamic manner. Creativity and inheritance are not contradictory, and integrating creativity into modern life is also one of the important ways for the development of handicraft-related intangible cultural heritage. The

extension of the industrial chain of the cultural and creative industry is a relatively important aspect of the protection of intangible cultural heritage. The combination of culture and creativity can not only bring about a certain amount of economic development, but more importantly, it can connect the "tradition and modernity" of local culture, promoting intangible cultural heritage to people's lives, allowing it to flourish while also being better protected. To protect and inherit the "Huojing" intangible cultural heritage of Bashu and to plan the future of the cultural and creative industry chain of ancient Shu civilization. By telling the Chinese story and ancient civilization story of Bashu's "Huojing", expressing it through international and modern digital creative means, and letting the world understand and recognize the culture of Bashu's "Huojing", we can strive to create a series of creative works that are valuable, meaningful, and marketable for the international market, ultimately achieving the cultural "going global" strategy.

The development of cultural and creative products for the "Huojing" in Bashu should be closely integrated with the local characteristic resources of the "Huojing". The focus should be on enhancing the tourist experience rather than simply increasing the quantity of cultural and creative products. Therefore, it is possible to create a concept that combines the reshaping and incubation of "Huojing" culture with heavyweight intellectual property that can be marketed globally. In terms of cultural protection, it is important to continue to explore the cultural connotations of "Huojing" and strengthen the protection of special non-legacy ancient towns, in order to present a cultural and tourism consumption scene that retains the original ecological features of these towns. Regular on-site research by experts and greater attention and support for the guardians, inheritors, and beneficiaries of intangible cultural heritage can also contribute to cultural preservation. In terms of cultural creativity, a continuous inheritance can be achieved through the use of digital cultural and creative media, such as animation, film, and short videos, as well as related products like stationery and toys, special cultural and creative museums, and theme parks. Exclusive leisure cultural industries such as "Huojing" and "Bashu Civilization" can be developed, including the creation of exclusive "escape room" dramas. Currently, cultural hot spots found in the "Huojing" ancient town include the "World's First Well of Fire", "Zhuge's Well", "Wen Jun's Hometown", and "Huojing Tea". Cultural events such as the "worship of the fire god ceremony," the Huojing town "driving day" activity, and the Huojing town forest fire warning day promotion activity have also been held. Other historical cultural hot spots that could be associated with the development of "Huojing" culture in the future include the "Most Colorful in the World - Qionglai Kilns," and "Huang Chongbao, the first female top scholar in China, hometown." Coordinated development of scenic spots along the Bashu civilization line is possible, which could promote a sustainable cultural tourism brand.

3.2.2 A Design Practice Plan for the "Huojing" Cultural and Creative Product

Below is an extraction of the inspirations from the "Huojing" culture, to plan and design an experiential tourism and educational cultural and creative product. The conceptual design of this cultural and creative product is a "Huojing Salt Making" experience toolkit. The tourists participating in the educational tour will understand the history and culture of the "Huojing" through 1 to 2 hours of cultural learning. They will personally make a handmade product using this toolkit, which can deepen their understanding of the cultural connotations of the "Huojing" through modern interpretation, thus achieving the goal of cultural heritage. The exterior design of the handmade kit adopts the pattern excavated from the Han dynasty salt well depicting the process of brine extraction and heating of Sichuan salt, using illustration to illustrate the scene on the packaging box of the toolkit. The interior of the handmade kit contains materials related to the production of salt blocks and ceramic image bricks, such as salt grains and clay. The kit comes with bamboo tubes, bamboo knives, and tracing paper etc. The instructional manual is produced in paper and includes new media scanning codes, providing details on the "Huojing" culture, salt block making, and image brick tracing processes. By organizing online and offline creative markets or other forms of business, a promotional platform is established to comprehensively showcase and expand the charming non-material cultural heritage of "Huojing," thereby enhancing its attractiveness and achievement conversion ability.



Figure 1. The pattern on Han Dynasty brick and rubbing of the image from a salt well (Huojing) in Eastern China.



Figure 2 shows the effect of the product design package for the "Huojing salt-making" cultural and creative experience tool.



Figure 3 shows the promotional design for the "Huojing" cultural and creative market.

4. Ren Naiqiang: "Huayang Guozhi Jiaobu Tuzhu", published by Shanghai Ancient Books Publishing House in 1987.
5. 6. Su Shi: "Shu Yan Shuo".

4. Conclusion

In the context of the global cultural industry, how to better promote and enhance the influence of the "Huojing" intangible cultural heritage. Creative tourism products are not only for profit, but also contain the humanistic feelings of a local area. By integrating culture into life through design, the essence of culture is reflected, providing spiritual needs for tourists and becoming a good carrier of memories. As a derivative of tourism, creative tourism products can not only promote the development of tourism, but also expand the reputation of the destination, becoming a "silent" business card.

Ultimately, industries pursue the maximization of profits. If the intangible cultural heritage is overly commercialized and excessively developed, it will also have an adverse impact on the protection of intangible cultural heritage. Therefore, a monitoring and evaluation system for the protection of intangible cultural heritage and a "cultural warning" mechanism should be established when establishing the cultural and creative industry. Related departments should take certain protective measures before the development and utilization of intangible cultural heritage, which can help to minimize damage and play a positive role in protecting and inheriting intangible cultural heritage. Intangible cultural heritage is not only a witness to history, but also a valuable cultural resource with significant value. Protecting intangible cultural heritage is not only a requirement of the country and the nation, but also a necessary requirement for the sustainable development of human society. This paper analyzes and explores the protection and inheritance modes of intangible cultural heritage in the context of cultural and creative industries using the background of the "Huojing" in Bashu. However, more people are needed to explore new models that are more suitable for each type of intangible cultural heritage.

REFERENCES

1. Huojingg Ancient Town - Baidu Baike: [https://baike.baidu.com/item/Huojingg Ancient Town/7811034?fr=aladdin](https://baike.baidu.com/item/Huojingg%20Ancient%20Town/7811034?fr=aladdin)
2. Huojingg - Baidu Baike: <https://baike.baidu.com/item/Huojingg/630448?fr=aladdin>
3. Ban Gu: "Jiaoshi Zhi" from "Hanshu", page 1035; "Dilizhi" from "Hanshu", page 1295, published by Zhonghua Book Company in 1999. [4] Zhang Hua: "Bowuzhi", cited in "Taiping Yulan" Volume 869, published by Zhonghua Book Company in 2011.