

Anthropogenic Submersion of Terrestrial Cultural Heritage sites leads to their Permanent Destruction and Demise

Ms. Zhang Yue (Masters' Student, Beijing Language and Culture University, Faculty of Foreign Studies)

ABSTRACT

As human societies continue to expand economically and socially in a divergent manner, the destruction of cultural heritage sites becomes almost inevitable. Since modern times in China, the construction of dams and reservoirs has led to the submersion of numerous valuable cultural relics and ancient sites, which has completely changed their living environment and caused irreversible damage. For example, the construction of the Three Gorges Dam resulted in the permanent submersion of the Fuling White Crane Ridge beneath the reservoir. Such cases are not unique to China but can be found throughout the Asia-Pacific region and even globally, as developing countries inevitably face the dilemma of prioritizing development or cultural heritage protection. If left unchecked, more terrestrial cultural heritage sites will be submerged underwater. This paper will utilize academic resources to focus on theoretical discussions, summarizing cases of anthropogenic submersion of cultural heritage sites and corresponding countermeasures and protective measures. It will further consider what types of human activities are permissible and which are ethically unacceptable when faced with both economic development and cultural heritage protection. The paper argues that when the urgency of economic development is questioned, we should prioritize the protection of cultural heritage and resist the practice of submerging cultural heritage sites underwater, which leads to their permanent destruction. Furthermore, the Convention on the Protection of Underwater Cultural Heritage sets a time limit for the definition of UCH—at least 100 years—raising questions about the scientific basis for this limit. This paper contends that the assessment of UCH should not be limited to this 100-year timeframe but should involve multi-angle, interdisciplinary evaluations based on the scientific, artistic, and cultural value of the heritage. Otherwise, heritage sites like the White Crane Ridge, which have immense value, may not receive adequate protection if they are not promptly designated as UCH after being submerged due to reservoir construction. Therefore, this paper will delve into the ethical issues mentioned above and attempt to offer suggestions for the sustainable development of UCH in the Asia-Pacific region.

Keywords: Underwater Cultural Heritage; Hydraulic Engineering; Convention on the Protection of Underwater Cultural Heritage; Sustainable Development

INTRODUCTION

Cultural heritage protection faces significant challenges during the process of economic and social development, especially in developing countries where irreversible damage often occurs in the pursuit of economic growth. This paper discusses the permanent destruction and demise caused by the anthropogenic submersion of heritage sites during the construction of dams and reservoirs and raises questions about the Convention on the Protection of Underwater Cultural Heritage in the hopes of offering suggestions for the sustainable development of UCH in the Asia-Pacific region.

CASE STUDIES OF HERITAGE SUBMERSION AND ITS IMPACTS

During the 1950s and 1960s, China engaged in hydraulic engineering projects, resulting in the submersion of a large number of terrestrial cultural heritage sites underwater. The sudden submersion of these heritage sites due to human activities drastically changed their living environment, causing irreversible damage to the relics and ancient sites.

The three gorges dam and white crane ridge

The White Crane Ridge inscriptions are the largest and most extensive hydrological inscriptions in existence, known as the "world's hydrological data treasury." They record local low water levels of the Yangtze River from 764 CE to 1909 CE, as well as historical, literary, artistic, and folklore information

during this period. The inscriptions serve as an essential source for the study of the hydrological history of the upper reaches of the Yangtze River.

The White Crane Ridge inscriptions use a unique method of recording water levels based on Chinese cultural traditions, with the stone fish as the reference point and inscriptions indicating the distance from the reference point. The creators of this unique method transformed dry numerical records into artistic creations rich in cultural and artistic connotations, and combined them with local folk activities like watching the stone fish emerge from the water and predicting harvests. This not only imbues these records with historical value but also turns recording water levels into a conscious action of local people, giving it a lasting vitality.

Today, when discussing the White Crane Ridge, one cannot ignore the closely related human activity—the construction of the Three Gorges Dam project. This is one of the largest power stations in China and the world, mainly serving water resource utilization, flood control, and power generation. After the Three Gorges Dam raised the water level to 175 meters, the water level along the Yangtze River significantly increased, submerging the White Crane Ridge inscriptions nearly 40 meters underwater, along with over 300 above-ground ancient sites and 400 underground ancient sites, totaling approximately 800 sites (Huang Wei 2011).

Reservoir construction and submersion of ancient villages

Technological advancements in the 20th century promoted industrialization, providing continuous vitality for infrastructure construction. Hydraulic engineering projects not only helped solve energy shortages but also served multiple functions such as flood control, irrigation, navigation, and employment, effectively addressing the slow economic and social development faced by developing countries in the Asia-Pacific region. Thus, countries in the region began to engage in hydraulic engineering projects to create economic value.

Vietnam began constructing the Hoa Binh Dam in 1979, which was completed and put into operation in 1994 as the largest hydropower station in Vietnam and one of the largest reservoirs in Southeast Asia. The Sesan River Reservoir project in Cambodia, located on one of the two main tributaries of the Mekong River, started in 2012 and began operating in 2017. The Laos government, in cooperation with Thailand and China, began constructing the Pak Beng hydropower station in 2017, which remains under construction.

However, while hydraulic engineering projects bring economic benefits, they also cause irreversible damage to the surrounding ecological environment and cultural heritage. Material cultural heritage, such as ancient villages, temples, ancestral halls, and other relics related to local ethnic cultures, are completely submerged with the reservoir's water storage, facing unprecedented challenges in their living environment. Underwater, cultural relics may be affected by water flow erosion, biological corrosion, and chemical reactions, further increasing the difficulty of protecting cultural heritage. From the perspective of intangible cultural heritage, the construction of hydraulic facilities forces some indigenous people to relocate. Over time, the traditional culture, lifestyle, and social structure formed by the indigenous people based on their living environment also change with the alteration of their living environment. This results in a significant loss of intangible cultural heritage passed down from generation to generation, such as social practices, conceptual expressions, and knowledge and skills. Consequently, we lose the opportunity to understand and inherit these unique cultures forever. In addition, reservoir construction disrupts river ecosystems, and water level fluctuations cause erosive geological changes. Water storage in reservoirs leads to sediment accumulation, downstream drought, and worsening saltwater intrusion, all of which negatively impact biodiversity and ecological balance and indirectly affect the preservation of local cultural heritage.

BALANCING HYDROPOWER DEVELOPMENT AND UCH PROTECTION

From the aforementioned cases, it is evident that developing countries in Asia have continued to construct hydropower projects in the past fifty years, with some completed and in operation, while others still under construction. In the process of economic development, developing countries inevitably face the dilemma of prioritizing development or cultural heritage protection. If left unaddressed, more terrestrial cultural heritage sites may be submerged during hydropower construction and left without adequate protection. Thus, this article will focus on theoretical perspectives to explore how to balance social development and cultural heritage protection, as well as how to make decisions when their interests conflict, in order to achieve sustainable development for both.

Conflict between hydropower development and cultural heritage protection

Firstly, hydropower development, such as dams and reservoirs, often requires construction in rivers, lakes, and other water bodies. These areas may contain sites and ancient structures of significant historical and cultural value. During hydropower construction, these cultural heritage sites may be submerged, preventing their values from being passed down. Moreover, hydropower development can alter the environment, such as water flow and levels, leading to site erosion, sediment changes, and subsequent effects on site integrity and preservation. Underwater archaeology is inherently more challenging than terrestrial archaeology, and hydropower projects further increase the difficulty and complexity of underwater archaeology conditions (Gribble 2013). The extent and completeness of underwater archaeological work directly influence the protection of UCH. In developing countries, limited economic development results in weak awareness of UCH protection among governments and the public, leading to insufficient investigation, planning, and assessment of potentially affected cultural heritage sites during the early stages of hydropower development. Additionally, limited resource allocation contributes to the challenge of initiating UCH protection efforts.

Ethical considerations and UCH protection

The conflicts mentioned above force us to confront a series of serious questions. How should we weigh the importance of hydropower development and cultural heritage protection when they conflict, and can their conflicts be reconciled? Through case analysis, we find that most developing countries prioritize hydropower development and seldom develop comprehensive protection plans for related cultural heritage at the early stages of construction. This is closely related to national economic strength and social context at the time. Following World War II, the acceleration of late modernity and globalization processes intensified people's linear experience of the past, resulting in increased vulnerability and uncertainty when facing crises and risks. Heritage and the past became topics of widespread public interest and concern. The heritage explosion around the 1970s further highlighted people's attention to heritage and its cultural core (Harrison 2013). However, this shift occurred during the deindustrialization period, and many already constructed industrial facilities, such as the hydropower projects mentioned in this article, had caused irreversible damage to cultural heritage. While the damage is done and cannot be reversed, it is still essential to deeply explore and analyze the ethical issues underlying this damage to provide theoretical insights for future cultural heritage protection and sustainable development.

Developing countries' series of hydropower projects were initially aimed at economic growth and development. While such infrastructure has indeed had positive impacts on societal and national development, it is crucial to consider how to properly preserve and accommodate cultural heritage and historical information during the construction of these projects. Otherwise, the loss of cultural heritage and traditional customs due to human intervention is a cost that neither we nor future generations can bear.

Achieving balance between economic development and cultural heritage protection

Ethical considerations concerning the submersion of terrestrial cultural heritage by human intervention can be summarized into two main questions: first, is the damage caused by artificially altering the environment of cultural heritage sites justifiable? Second, has the consent of the public who value the cultural heritage been obtained before submerging terrestrial heritage sites? When conflicts arise between economic development and cultural heritage protection, the optimal solution should involve achieving a balance between the two through sustainable means. The construction of the Three Gorges Dam led to the submersion of Baiheliang, but with the growing emphasis on the cultural industry, relevant departments have made great efforts to protect this precious cultural heritage. The underwater protection project of Baiheliang inscriptions at their original site is the most challenging, technologically advanced, and heavily invested cultural heritage protection project within the globally watched Three Gorges cultural relics protection. Adopting the "pressureless container" principle and constructing an underwater museum for in-situ protection has become the world's first successful example of protecting similar cultural heritage, with UNESCO praising it as the world's first underwater site museum accessible without diving (Jiang Rui 2020). In addition, the site has carried out cultural dissemination and educational work to raise public awareness and protection consciousness for Baiheliang inscriptions.

The successful protection of Baiheliang inscriptions demonstrates that although the construction of the Three Gorges Dam inevitably caused damage to cultural heritage, it is an indispensable part of national economic development. Without an economic foundation, how can cultural heritage be protected? Therefore, this article argues that when economic development becomes an obstacle to human survival and social progress, appropriate changes can be made to cultural heritage. At the same time, people should always remember the contributions of cultural heritage to human progress and provide better protection when they have the capacity. However, if the urgency of economic development is questioned, actions that submerge terrestrial cultural heritage in water against ethical principles should be firmly prevented. Furthermore, since heritage began involving the public domain (Lowenthal 1996), public participation has become an essential part of heritage protection and utilization. Decisions on whether to submerge terrestrial cultural heritage in water should not rely solely on official authorities; relevant heritage organizations should conduct thorough public surveys and listen to the opinions of the public.

QUESTIONING AND REFLECTION ON THE 100-YEAR TIME LIMIT OF THE UCH PROTECTION CONVENTION

This article focuses on a series of ethical issues brought about by human activities such as the construction of water conservancy projects, which cause terrestrial cultural heritage to be submerged underwater. In attempting to seek better protection for such damaged cultural heritage, legal and institutional obstacles have been encountered. The "Underwater Cultural Heritage Protection Convention" passed by UNESCO in 2001 is the first international convention on the protection of UCH worldwide (Dromgoole 2013). The convention stipulates that UCH refers to all human remnants with cultural, historical, or archaeological value, such as sites, buildings, artifacts, human remains, ships, and aircraft, as well as their archaeologically valuable environments and natural environments, which have been partially or entirely underwater for at least 100 years, periodically or continuously. According to this provision, cultural heritage with significant historical, scientific, and artistic value, such as Baiheliang inscriptions, is not considered UCH under the convention's definition when submerged underwater due to human activities. Many scholars have questioned the 100-year time limit, arguing that this rigid standard lacks scientific basis and is purely for management purposes to exclude items of more recent origin. However, many countries' cultural heritage laws use this time limit (Ma Mingfei 2018). To more comprehensively and objectively assess the value of UCH, it is necessary to adopt multiple indicators rather than simply relying on the 100-year time limit. This assessment process may involve interdisciplinary collaboration, including experts in fields such as history, archaeology, art history, and environmental science (Forrest 2014). In fact, in some cases,

more recent heritage may have more urgent protection needs, such as the risk of natural disasters or human destruction. Otherwise, a large number of heritage sites will be excluded and not receive effective protection.

SUGGESTIONS AND CONCLUSIONS

This article uses academic resources to focus on theoretical discussions, summarizing cases of human-caused submersion of cultural heritage underwater and corresponding countermeasures and protection measures, and further considering what human activities are permissible and which ones are unethical when facing both economic development and cultural relic protection. The paper argues that when the economic foundation threatens human survival and social development, appropriate changes can be made to cultural heritage by fully listening to public opinion and promoting public participation, and better protection can be provided for damaged heritage when the capacity is available. However, when the urgency of economic development is questioned, we should prioritize the protection of cultural heritage and resist actions that deliberately submerge cultural heritage underwater, causing permanent damage. Furthermore, this article questions the scientific and accurate nature of the 100-year time limit for the definition of UCH in the "Underwater Cultural Heritage Protection Convention," as this time limit determines the future protection of UCH.

The protection of UCH faces many challenges, and seeking a balance between economic development and cultural heritage protection is a complex and important task. We need to make efforts in various aspects, such as improving policies and regulations, supporting scientific and technological research, international cooperation and exchanges, and public participation and education, to better protect and inherit these precious cultural heritages and contribute to the sustainable development of UCH in the Asia-Pacific region and the world.

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