SURVEY OF HERITAGE EXAMPLES:

| *Nüshu (Women's Script)*

| *Hoh Xil National Nature Reserve*

| *Loulan Ancient City*

IS5110 DIGITAL HERITAGE_COURSEWORK1

YEAR 2024-2025

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EXAMPLE 1: Nüshu (Women's Script)

1.1 Nature and Value

Nüshu, literally "women's writing," is an intangible unique syllabic script derived from Chinese characters. It originated in Jiangyong County, Hunan Province in China, during the Ming and Qing dynasties. Created and used exclusively by women, this script is characterized by its rhomboid shape and delicate, thread-like strokes. The way of writing Nüshu is usually vertically from right to left. This writing style is in contrast to that of Chinese characters, aligns with women's spiritual needs and seems to be the resistance against traditional norms and the patriarchal system. Nüshu served as a medium for women to express emotions and fold traditions, share personal narratives, build female solidarity, particularly through letters and songs. Some are inscribed on fans, handkerchiefs, and cloth (Chen, 2018). This world's only gender-exclusive writing system represents a form of intangible cultural heritage. It holds immense linguistic, anthropological, and feminist significance, offering insights into marginalized women's resilience and creativity (Smith, 2008).

1.2 Current Use of Digital

- **Digitization and Unicode Integration:** Nüshu was encoded into Unicode Standard 13.0 in 2020 (Unicode, 2017) and is enabled to use in digital platforms. Projects like the Nüshu Input Method on GitHub provide tools for inputting Nüshu characters using romanized dialects or Mandarin pinyin ((Github, 2018).

- **Virtual Archives and Education:** Online dictionaries have been developed to document Nüshu characters and their usage (Manhua, 2019). These efforts above not only aid in the script preservation but also facilitate its learning and use among younger generations.

1.3 Toolkit Selection to Support UN Sustainable Development Goals (SDGs)

Toolkits	UN-SDGs
"If/Then Gender Equity Project"	**SDG 5.B:** Promote Empowerment of Women Through Technology

The "If/Then Gender Equity Project" toolkit can be used to contribute to SDG 5.B by showcasing diverse female STEM professionals in museum exhibits and educational content, inspiring young women and girls to pursue careers in these fields. By challenging stereotypes and promoting gender diversity in STEM representation, the project empowers

women through increased visibility and role models in technology-related professions. Additionally, the project encourages public conversation around gender equity, further supporting the empowerment of women in STEM and aligning with the goals of SDG 5.B.

EXAMPLE 2: Hoh Xil National Nature Reserve

2.1 Nature and Value

Qinghai Hoh Xil, located in the northeastern part of the Qinghai-Tibetan Plateau, is the world's largest, highest, and youngest plateau. The site covers 3,735,632 hectares with a 2,290,904-hectare buffer zone, encompassing alpine mountains and steppe systems at elevations over 4,500 meters above sea level (UNESCO, 2024). Known as the "Third Pole," Hoh Xil features a frigid plateau climate. Its unique geological formations and climatic conditions nurture exceptional biodiversity. The area is critical for Tibetan antelope migration, supporting nearly 40% of the global population and their complete lifecycle, including calving grounds and migration routes. The landscape's stunning visual impact and ecological significance make it a UNESCO World Heritage site, recognized for its outstanding universal value. Its ecological integrity makes it vital for biodiversity conservation and climate research.

2.2 Current Use of Digital

- **Satellie Surveillance and Meteorological Monitoring:** Satellite tracking and remote sensing are used to monitor wildlife movements, particularly Tibetan antelope migration, and to assess habitat changes due to climate change (News, 2023). Meteorological Monitoring provide real-time data for ecological research and support adaptive management strategies, such as corridor management to mitigate human-wildlife conflicts (Zhang, 2023).

- **VR Documentaries**: Collaborations like BBC's *Hoh Xil: The Last Pure Land* use 360° footage to raise global environmental awareness (Tencent, 2022).

2.3 Toolkit Selection to Support UN Sustainable Development Goals (SDGs)

Toolkits	UN-SDGs

| **"Climate Toolkit"** | **SDG 13.3:** Build Knowledge and Capacity to Meet Climate Change |

The Climate Toolkit provides a structured set of goals and resources that help museums, gardens, and zoos learn about and address climate change, thereby building their knowledge and capacity in this area. It offers access to educational materials, such as blogs, newsletters, and webinars, which enhance understanding of climate change and how to combat it. By facilitating collaboration and the sharing of best practices among institutions, the Climate Toolkit strengthens the collective ability to meet climate change challenges, aligning with SDG 13.3's aim to build knowledge and capacity.

EXAMPLE 3: Ancient Lonlan Kingdom

3.1 Nature and Value

The Loulan Kingdom, an ancient oasis city along the Silk Road in northwest China, flourished from the 2nd century BCE to the 3rd century CE. Its ruins, including Buddhist stupas and wooden tablets, reflect multicultural exchanges between Han China, Central Asia, and Persia. Designated a cultural heritage site, it offers archaeological insights into ancient trade and urbanization. The decline of Loulan, linked to environmental changes and water resource mismanagement, offers insights into sustainable development challenges (Xu, et al., 2023).

3.2 Current Use of Digital

- **3D Scanning for Digital Archive and Virtual Reconstruction:** A digital preventive conservation project was implemented, which involves 3D laser digital scanning has been used to create digital archives (CHINADAILY, 2024) for over a hundred cultural relics and enables virtual tourism.
- **Digital Exhibition:** The Loulan Museum in Ruoqiang County houses over 5,700 artifacts, including mummies and brocades, and offers digital exhibits to educate visitors. This museum has launched a **QR code** self-guided tour service, enabling visitors to scan codes and listen to explanations of the exhibits (CNRN, 2023).

3.3 Toolkit Selection to Support UN Sustainable Development Goals (SDGs)

Toolkits	**UN-SDGs**

"Akwé: Kon Voluntary guidelines for the conduct of cultural, environmental and social impact assessments"

SDG 8.9: Promote Beneficial and Sustainable Tourism

This toolkit can be used to guide and facilitate the achievement of SDG 8.9 by emphasizing the importance of sustainable tourism in their framework. They encourage the protection and safeguarding of cultural and natural heritage, which is essential for promoting beneficial tourism that respects local traditions and environments. By involving indigenous and local communities in the impact assessment process, the guidelines ensure that tourism development is aligned with the values and needs of those communities, thus contributing to sustainable and inclusive tourism practices.

Chen, X., 2018. *UNESCO.* [Online]
Available at: https://courier.unesco.org/en/articles/nushu-tears-sunshine
CHINADAILY, 2024. *Exploring the lost land of Loulan.* [Online]
Available at: http://en.chinaculture.org/a/202404/22/WS6625b5f2a31082fc043c3232.html
CNRN, 2023. *Bring Cultural Relics to Life: Let the Splendor of Loulan Culture Remain Unfading.*
Available at: https://www.163.com/dy/article/I1HV7KP80514R9NP.html
Github, 2018. *nushu-script.*
Available at: https://github.com/nushu-script/rime-nushu
Manhua, Z., 2019. *Designonline.*
Available at: https://www.dolcn.com/archives/18748
News, Y. E., 2023. *Tibetan antelope migration season, satellites reveal why the spectacular scene of thousands of antelopes running together reappears.*
Available at: https://cj.sina.com.cn/articles/view/1653603955/628ffe7302001h4uu
Smith, B. G., 2008. *The Oxford Encyclopedia Women in World History.* [Online]
Available   at:
https://www.oxfordreference.com/display/10.1093/acref/9780195148909.001.0001/acref-9780195148909-e-780
UNESCO, 2024. *Qinghai Hoh Xil.* [Online]
Available at: https://whc.unesco.org/en/list/1540/
Unicode, 2017. *Unicode - The World Standard for Text and Emoji.* [Online]
Available at: https://www.unicode.org/charts/PDF/U1B170.pdf
Xiaorong, C., 2018. *Nüshu: from tears to sunshine.* [Online]
Available at: https://courier.unesco.org/en/articles/nushu-tears-sunshine
Xu, D. et al., 2023. Relationship between the rise and fall of Loulan ancient city and centennial-scale climate events and cycles. *Frontiers of Earth Science,* 22 11, Volume 17, pp. 1070-1080.
Zhang, Y., 2023. *The long-term monitoring plot in Hoh Xil has been equipped with a standard meteorological observation station, which is now officially in operation.* [Online]
Available   at:
https://www.stdaily.com/index/kejixinwen/202309/07f286445d3246ca943105426fbddf2a.shtml