The Making of the Chinese Landscape: The Jianghan Plain as a Case Study

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Abstract

The landscape of the Jianghan Plain can be seen as a vivid example of this combination of old and new, past and present, reflecting the adaptive response of people living here for thousands of years. This adjustment results from climate change, geological and tectonic forces, and human interference. This thesis investigates the evolution of the Jianghan Plain's landscape from the Palaeolithic to the present. The results show that the primary determinative factors in landscape evolution are climate change, the landscape of topographical units, and the evolution of the ancient cluster of Yunmengze Lake. Human activities, such as building settlements, cultivating land, constructing water projects, and transmitting culture, have gradually changed the landscape from primeval to complex and adapted it to new situations.

This thesis adopts W. G. Hoskins' historical rural survey method in *The Making of the English Landscape* and uses it to conduct landscape history research in China's landscape history. Hoskins' method can explain the early occupation and subsequent changes of the landscape over time. In contrast with Hoskins' focus on historical narratives of linear historical time and private land ownership, this study emphasizes the collective land management ways and ecological adaptation strategies in China. The results show that the resilience of Chinese landscapes lies in the fine line between natural constraints and human ingenuity, and this balance has guided the evolution of the Chinese landscape in different periods.

As an important case study, the Jianghan Plain fills gaps in long-term landscape research in China and presents a 'Chinese solution' in landscape history. Facing modernization, this study focuses on the urgent balance between development and cultural landscape protection. This balance makes the Jianghan Plain thrive, balancing historical understanding and current demands, and human-environment interrelationship with nature.

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List of Figures

Figure 1. The Three Major Stages of Chinese Landforms (Source: 尤联元，杨景春，*中国地貌*,（北京：科学出版社，2013），页 2. / Lianyuan You, Jingchun Yang, *Chinese landform*, (Beijing: China Science Publishing, 2013), p. 2.

Figure 2. slope classification. (Source: The Office of the Leading Group for the First National Geographic Conditions Census in Hubei Province, 'Topography and landforms (including the elevation classification across the province, slope classification, and the area composition and spatial distribution of landform types)', *Department of Natural Resources of Hubei Province*, 2017, <https://zrzyt.hubei.gov.cn/bmdt/ztzl/hbsdycqgdlgqpcgb/gbfb/201910/t20191031_209613.shtml> [accessed 10 December 2020])

Figure 3. landform type (Source: The Office of the Leading Group for the First National Geographic Conditions Census in Hubei Province, 'Topography and landforms (including the elevation classification across the province, slope classification, and the area composition and spatial distribution of landform types)', *Department of Natural Resources of Hubei Province*, 2017, <https://zrzyt.hubei.gov.cn/bmdt/ztzl/hbsdycqgdlgqpcgb/gbfb/201910/t20191031_209613.shtml> [accessed 10 December 2020])

Figure 4. Digital Elevation Model (DEM) data elevation simulation map of the Jianghan Plain (Source: created by the author)

Figure 5. The geographical expanse of the Jianghan Plain (Source: created by the author)

Figure 6. The Jianghan Basin Structure (Source: created by the author)

Figure 7. Schematic Diagram of Quaternary Deposition Distribution in the Jianghan Plain (Source: 徐杰,邓起东,张玉岫,殷秀华,虢顺民,牛娈芳,'江汉-洞庭盆地构造特征和地震活动的初步分析',*地震地质*,4(1991),页 332-342. / Jie Xu, Xiu Wang, Xiuhua Yin, Shunmin Guo, Luanfan Niu, Structural Features and Seismicity in Jianghan-Dongting Lake Basin', Seismology and Geology, 4 (1991), pp. 332-342)

Figure 8. Qingling Mountains (Source: recreated by the author, based on Google Earth)

Figure 9. Distribution map of archaeological sites for mammalian fossils from the Palaeolithic period. (Source: created by the author)

Figure 10. Sedimentation Rates During the Holocene Epoch in the Jianghan Plain Region (Source: 王张华，Liu J P, 赵宝成，〈全新世长江泥沙堆积的时空分布及通量估算〉，*《古地理学报》*，4（2007），页 419-429. / Zhanghua Wang, J P Liu, Baocheng Zhao, 'Spatial and temporal distribution of Changjiang sediments and estimation of sediment budget during the Holocene', *Journal of Palaeogeography*, 4 (2007), pp. 419-429.)

Figure 11. Diagrammatic Representation of the Yunmengze Lake Cluster during the Qin Dynasty. (Source: 张修桂，〈云梦泽的演变与下荆江河曲的形成〉，*《复旦学报（社会科学版）》*, 2（1980），页 40-48，（第 40 页）. / Xiugui Zhang, 'The Evolution of Yunmengze and the Formation of the Lower Jingjiang River Meander', *Fudan*

Journal (Social Sciences Edition), 4 (2007), pp. 419-429, (p. 40).)

Figure 12. Distribution map of Neolithic Sites in Hubei Province. (Source: created by the author)

Figure 13. Map of Shishou National Nature Reserve for Elk. (Source: based on the Google Earth)

Figure 14. Shishou National Nature Reserve for Elk. (Source: Hubei Daily, 'Encountering Shishou: Exploring the Habitat of Two National Treasures', *Hubei Daily*, 2023, <https://news.hubeidaily.net/mobile/c_1933981.html>, [accessed 03 December 2023])

Figure 15. The front page of the 357th edition of the scientific journal Nature from 1992 (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 31. / Miao Yu, *'Prehistoric times in the middle reaches of the Yangtze River',* (Wuhan: Wuhan University Press, 2020), p. 31.)

Figure 16. Place of birth of the Yunxian People in the Palaeolithic Age (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 24. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), p. 24.)

Figure 17. location of the Jigongshan site (Source: created by the author)

Figure 18. The Plan of Stone Circle (Source: 刘德银，王幼平，〈鸡公山遗址发掘初步报告〉，《人类学学报》, 2（2001），页 102-114，（第 106 页）. / Deyin Liu, Youping Wang, A Preliminary Report on the Excavation of Jigongshan Site.', *Acta Anthropologica Sinica*, 2 (2001), pp. 102-114, (p.106).)

Figure 19. Simulating the Reconstruction of Shelters for Palaeolithic Humans (Source: hand-drawn by the author)

Figure 20. A rudimentary dwelling situated adjacent to agricultural fields in the Jianghan Plain. (Source: captured by the author)

Figure 21. Shijiahe culture ceramic figurines of fauna (Source: 王劲，〈浅议石家河文化陶塑艺术〉，《华夏考古》, 4 （2011），页 51-78. / Jin Wang, 'A Brief Examination of the Ceramic Sculpture Art of the Shijiahe Culture', *Huaxia Archaeology*, 2 (2011), pp. 51-78.)

Figure 22. Geological Map of Hubei Province （Source: recreated by the author, based on '中国国家文物局主编，《中国文物地图集（湖北分册）》，（西安：西安地图出版社，2002），页 34. / Edited by the National Cultural Heritage Administration of China, Cultural Relics Atlas of China (Hubei Volume), (Xi'an: Xi'an Map Press, 2002）, p. 34)

Figure 23. Charred rice dating back to the Neolithic era has been unearthed at the archaeological site of Yejiamiao (Source: 吴传仁, 刘辉, 赵志军, 〈从孝感叶家庙遗址浮选结果谈江汉平原史前农业〉，《南方文物》, 4（2010），页 65-69. / Chuanren

Wu, Hui Liu, Zhijun Zhao, 'Discussing Prehistoric Agriculture in the Jianghan Plain Based on the Flotation Results from the Yejia Temple Site in Xiaogan', *Cultural Relics in Southern China*, 4 (2010), pp. 65-69.)

Figure 24. The Flotation Process of Carbonized Plant Remains at the Qujialing Site (Source: created by the author, based on 'Muslim Khan, Ling Yao, Yuzhang Yang, Yang Tao, Weiya Li, Dewei Zhang, Yunbing Luo, Juzhong Zhang, 'Plant foods consumed at the Neolithic site of Qujialing (ca.5800-4200 BP) in Jianghan Plian of the middle catchment of Yangtze River, China', *Plant Systematics and Evolution*, 13 (2022.)

Figure 25. Location of Chengtoushan site (Source: created by the author)

Figure 26. Plan of Neolithic Rice Paddy Ruins (Source: 何介钧, 安田喜宪，*《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*，（北京：文物出版社, 2017），页 166. / Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain*), (Beijing: Cutural Relice Publishing House, 2017), p. 166.)

Figure 27. Ancient paddy field and field ridge (Source: 何介钧, 安田喜宪，*《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*，（北京：文物出版社, 2017）/ Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain),* (Beijing: Cutural Relice Publishing House, 2017))

Figure 28. Aerial Photograph of the Maoshan archaeological site (Source: Pin Ding, Yunfei Zheng, Xugao Chen, Shaobin Zhong and Ningyuan Wang, 'Linping Maoshan

Site, Yuhang, Zhejiang', *China Heritage Daily*, 3 (2010), p. 4.)

Figure 29. An aerial depiction of the remnants of rice fields found at the Maoshan archaeological site (Source: recreated by the author, based on '赵晔，〈浙江余杭临平遗址群的聚落考察〉，*《东南文化》*，3（2012），页 31-39，（第 33 页）. / Ye Zhao, 'Investigations on the Archaeological Ensemble of Heritage Sites at Linping,Yuhang', *Southeast Culture*, 3 (2012), pp. 33-34, (p. 33)'.)

Figure 30. Speculating the Neolithic Rice Field System in the Jianghan Plain: A Reconstruction. (Source: created by the author)

Figure 31. Sun Man Stone Carving (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 163. / Miao Yu, Prehistoric times in the middle reaches of the Yangtze River, (Wuhan: Wuhan University Press, 2020), p. 163.)

Figure 32. Flotation process applied to charred botanical remains discovered at the Shijiahe Site Cluster. (Source: created by the author, based on '邓振华，刘辉，孟华平.〈湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析〉，*《考古》*，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, Archaeology, (01) 2013, pp. 91-99.)

Figure 33. Floatation process for carbonized edible remains of wild plants at the Shijiahe archaeological site (Source: created by the author, based on 邓振华，刘辉，孟华平.〈湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析〉，*《考古》*，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in

Tianmen, Hubei, *Archaeology,* (01) 2013, pp. 91-99.)

Figure 34. The present study focuses on the reconstruction of the Neolithic Age's human habitation environment in the Jianghan Plain (Source: created by the author)

Figure 35. Distribution of Neolithic Ancient City Sites in Hubei Province (Source: created by the author)

Figure 36. The dispersion pattern of Neolithic settlements within Hubei Province (Source: created by the author, use ArcMap)

Figure 37. The archaeological discovery of a fragmented canoe at the Neolithic Kuahuqiao site (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 63. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 63.)

Figure 38. Jianghan Plain lake system (Source: 徐瑞瑚，谢双玉,赵艳,<江汉平原全新世环境演变与湖群兴衰>，*《地域研究与开发》*，4（1994），页 52-56. / Ruihu Xu, Shuangyu Xie, Yan Zhao, Holocene Environmental Changes and the Dynamics of Lake Systems in the Jianghan Plain, *Areal Research and Development,* 4 (1994), pp. 52-56.)

Figure 39. Profile map of the surrounding environment of the Zoumaling Ancient City Site (Source: created by the author)

Figure 40. Shijiahe archaeological site group and the foothills of Dahongshan Mountain （Source: captured by the author）

Figure 41. The southern section of the Shijiahe archaeological site group (Source: captured by the author)

Figure 42. Geographical and Topographical Map of the Southern Foot of the Dahongshan Mountain (Source: created by the author, use ArcMap)

Figure 43. Road network overlay (Source: created by the author, use ArcMap)

Figure 44. The encompassing geographical surroundings of the Jingxiang ancient road (Source: created by the author, use ArcMap)

Figure 45. Jingxiang Ancient Road Remains. (Source: Jingzhou Archive, 'The site of the Jingxiang Ancient Road', Jingzhou Archives Information Network, 2008, <http://www.jmdaxxw.com/read.asp?id=704>, [accessed 13 January 2021])

Figure 46. Three-Dimensional Simulation of the Geographical Surroundings of the Historic Jingxiang Ancient Road (Source: created by the author, use ArcMap)

Figure 47. Distribution map of settlements along the Yangtze River. (Source: created by the author)

Figure 48. Scattered villages in the Jianghan Plain (source: Captured by the author)

Figure 49. Villages in the Jianghan Plain （Source: Captured by the author）

Figure 50. Settlement Patterns in the Jianghan Plain during the Neolithic Age (Source: created by the author)

Figure 51. Aerial photograph of the ancient remains of Zoumaling settlement site. (Source: 湖北省文物考古研究所编,*《湖北史前城址》*,(北京:科技出版社,2015),页：彩页 18. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 18)

Figure 52 . Zoumaling settlement site plan. (Source: 陈官涛，〈湖北石首市走马岭新石器时代遗址发掘简报〉，*《考古》*，4（1998），页 16-38. / Guantao Chen, Excavation Brief of the Neolithic Site at Zhaomaling, Shishou, Hubei', *Archaeology*, 4 (1998), p 16-38.)

Figure 53. Zoumaling Settlement Site Ruins' location. (Source: created by the author, based on the Google Earth)

Figure 54. Zoumaling Settlement Site Analysis Map. (Source: created by the author, based on the Google Earth)

Figure 55. Aerial photograhp of the ancient remains of Zoumaling settlement site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，彩页 19. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, p. colour plate 19.)

Figure 56. Aerial photograph of the ancient remains of Zoumaling settlement site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，彩页 18. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, p. colour plate 18.)

Figure 57. Topographic map of the Zoumaling ancient city (Source: recreated by the author, based on 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294，（第 228 页）. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294, (p. 228).)

Figure 58. Zoumaling Settlement Site City Wall Profile Diagram. (Source: 单思伟，余西云，<湖北石首市走马岭新石器时代城址的发掘>，*《考古》*，9（2018），页 3-24. / Siwei Shan, Xiyun Yu, 'Excavation of the Neolithic site at Zhaomaling, Shishou City, Hubei', Archaeology, 9 (2018), pp. 3-24.)

Figure 59. Aerial photograhp of the ancient remains of Zoumaling settlement site. ('p'

area) (Source: 孟华平，向其芳，*《湖北史前城址》*，（北京：科学出版社，2015），彩页 20. ／ Huaping Meng, Qifang Xiang, *Prehistoric City Sites in Hubei,* (Beijing: Science Press, 2015), p. colour plate 20.)

Figure 60. Aerial view of Shijiahe Ancient City Settlement. (Source: created by the author, based on 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.))

Figure 61. Micro-geomorphology and Site Distribution of the Shijiahe Settlements Site Group. (Source: recreated by the author, based on '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：8. ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 8.)

Figure 62. Elevation map of the Shijiahe Ancient Settlement Site. (Source: created by the author, use ArcMap)

Figure 63. 3D topographic map of the Shijiahe Ancient Settlement Site. (Source: created by the author, use ArcScene)

Figure 64. restoration of microgeomorphic evolution of shijiahe site group (Source: 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：98.

/ Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 98.)

Figure 65. Location map of the Shijiahe Ancient City Settlement Site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，〈石家河遗址群调查报告〉，*《南方民族考古》,*（00）1993，页 213-294. /A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology,* (00) 1993, pp. 213-294.)

Figure 66. Aerial Photograph of Shijiahe Site. (Source: captured by the author)

Figure 67. Shijiahe Ancient City Settlement Site Zoning Map. (Source: hand-drawn by the author)

Figure 68. Reconstruction Drawing of Tanjialing Site. (Source: hand-drawn by the author)

Figure 69. Aerial Photograph of Shijiahe Site. (Source: captured by the author)

Figure 70. Pottery sculpture in the shape of a sheep. (Source: captured by the author)

Figure 71. Pottery sculpture in the shape of a chicken. (Source: captured by the author)

Figure 72. Pottery sculpture in the shape of animals. (Source: Miao Yu, Prehistoric times in the middle reaches of the Yangtze River, (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 304. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020.)

Figure 73. Photo of the Shijiahe archaeological site. (Source: captured by the author)

Figure 74. Site photo of the Retaining Dam Remains in the City Moat of the Shijiahe Ancient City Settlement. (Source: captured by the author)

Figure 75. Illustration of the retaining dam within the city moat in Shijiahe ancient city settlement. (Source*:* 方勤， 赵阳, 李瑞, 王琢玺, 钟倩, 朱世乾, 昝存宝, 李晓杨, 杨宇阳，<天门石家河城址及水利系统的考古收获>，*《江汉考古》*，（01）2023，页 19-35，（第 32 页） / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system'*, Jianghan Archaeology*, (01) 2023, pp. 19-35, (p. 32).)

Figure 76. Reconstruction of Life Scenes in Shijiahe Ancient City Settlement. (Source: created by the author)

Figure 77. The red pottery cups discovered at the Sanfangwan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 288-289. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan

University Press, 2020), pp. 288-289.)

Figure 78. Photographs of the Sanfangwan archaeological site. (Source: captured by the author)

Figure 79. Speculative visual representation of the Yinxintai Site in the Shijiahe Ancient Settlement Site. (Source: hand-drawn by the author)

Figure 80. The Yinxintai archaeological excavation site. (Source: captured by the author)

Figure 81. Floor Plan of House Remains (F22) at the Guanmiaoshan Site. (Source: 李文杰，沈强华，任式楠，<湖北枝江关庙山遗址第二次发掘>，*《考古》*，1（1983），页 17-29. / Wenjie Li, Qianghua Shen, Shinan Ren, 'Second Excavation of the Guanmiaoshan Site in Zhijiang, Hubei', *Archaeology*, 1 (1983), pp. 17-29.)

Figure 82. Panoramic View of the House Remains (F30) in the Guanmiaoshan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 170. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 170.)

Figure 83. Restoration of the wooden frame of the house. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 171. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), p. 171.)

Figure 84. The fire pit located within the remnants of the dwelling at Guanmiaoshan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 172. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 172.)

Figure 85. Architectural remnants of Neolithic dwellings at Menbanwan Site. (Source: 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 33. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 33)

Figure 86. Floor plan depicting the architectural remnants of residential structures found at the Menbanwan Archaeological Site. (Source: recreated by the author, based on '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页 308. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 308.)

Figure 87. Hand-drawn Reconstruction of Houses at the Menbanwan Site (Source: recreated by the author)

Figure 88. Speculative Reconstruction Map of Residents' Living Scenes Beyond the Shijiahe Ancient City Settlement. (Source: hand-drawn by the author)

Figure 89. Speculative visual representation of a storage within the archaeological site of the Shijiahe ancient city settlement. (Source: recreated by the author, based on: 于

淼，《长江中游的史前时代》，（武汉：武汉大学出版社，2020），页 139. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River, (*Wuhan: Wuhan University Press, 2020), p. 139.)

Figure 90. Speculative visual representation of storage and pit within the archaeological site of the Shijiahe ancient city settlement. (Source: created by the author, based on '于淼，《长江中游的史前时代》，（武汉：武汉大学出版社，2020），页 139. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River, (*Wuhan: Wuhan University Press, 2020), p. 139.)

Figure 91. The dispersion pattern of Shang Dynasty's settlements within Hubei Province （Source: created by the author, use ArcMap）

Figure 92. Distribution Map of Rivers in Hubei Province. (Source: created by the author, use ArcMap)

Figure 93. Aerial Photograph of the Yinxiangcheng Site in Jingzhou. (Source: recreated by the author, based on the '孟华平，向其芳，*《湖北史前城址》*，（北京：科学出版社，2015），页：彩版三五. / Huaping Meng, Qifang Xiang, *Prehistoric city ruins in Hubei*, (Beijing: China Science Publishing & Media Ltd), p. colour plate 35.')

Figure 94. Master Plain of the Yinxiangcheng Site. (Source: recreated by the author, based on the '院文清，*〈湖北荆州市阴湘城遗址东城墙发掘简报〉*，*《考古》*，05（1997），页 1-10，（第 3 页）. / Wenqing Yuan, 'Concise Overview of the Eastern City Wall Excavation at the Yinxiangcheng Site in Hubei's Jingzhou City', *Archaeology*,

05 (1997), 1-10 (p. 3).)

Figure 95. The settlements dispersion of Spring and Warring State Period within Hubei Province （Source: created by the author, use ArcMap）

Figure 96. The initial type settlement – ‘Panlongcheng Site’, (Source: recreated by the author, based on the Google Earth)

Figure 97. The initial type settlement – ‘Shaishutai Site’, (Source: created by the author, based on the Google Earth)

Figure 98. The initial type settlement – ‘Ji’nan City Site’, (Source: recreated by the author, based on Google Earth)

Figure 99. The second type settlement – ‘Xianglushan Site’, (Source: recreated by the author, based on Google Earth)

Figure 100. The master plan of the Panlongcheng Site (Source: 湖北省文物考古研究所,《盘龙城-1963-1994 年考古发掘报告 （上册）》,（北京：文物出版社，2001），页 15. / The Hubei Provincial Institute of Cultural Relics and Archaeology, The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I), (Beijing: Cultural Relies Press, 2001), pp. 15.)

Figure 101. City wall remains in the Panlongcheng Site. (Source: captured by the author)

Figure 102. Satellite image of Ji'nan City Site (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），彩版 4. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nan City: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, colour edition. 4.)

Figure 103. Reconstruction of the palace at Panlongcheng Site (Source: 湖北省博物馆，*《盘龙城-长江中游的青铜文明》*，（北京：文物出版社，2007），页 13. / Hubei Province Museum, *Panlongcheng – Bronze Civilization in the Middle Reaches of the Yangtze*, (Beijing: Cultural Relies Press, 2007), p. 13.)

Figure 104. Satellite image of Jingnansi Settlement Site (Source: recreated by the author, based on Google Earth)

Figure 105. Map of the location of the Ji'nan City Site, (Source: created by the author, use ArcMap)

Figure 106. Map of the ancient water system in the Ji'namcheng Site, (Source: created by the author, based on the 'Distribution map of the ruins of Ji'nan City', 湖北省博物馆，<楚都纪南城的勘查与发掘（上）>，*《考古学报》*，03（1982），页 325-350，（第 331 页）. / Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica,* 03 (1982), 325-350 (p. 331).)

Figure 107. Aerial photograph of Ji'nan City Site. (Source: captured by the author)

Figure 108. Aerial photograph of Ji'nan City (Source: captured by the author)

Figure 111. Tripod cooking vessel in the Ji'nancheng Site, (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），页 76. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nancheng: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, p. 76.)

Figure 112. Distribution map of the ruins of Ji'nancheng, (Source: 湖北省博物馆，<楚都纪南城的勘查与发掘（上）>，*《考古学报》*，03（1982），页 325-350，（第 331 页）. / Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica*, 03 (1982), 325-350 (p. 331).)

Figure 113. Demonstration of a 3D model of the Ji'nan City Site., (Source: created by the author)

Figure 114. Location Map of the F1, F2, and F3 Palace Foundations within Panlongcheng Site. (Source: 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 43. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 43.)

Figure 115. Plan of Erlitou Site No.2 palace ruins (Source: 赵芝荃，郑光，<河南偃师二里头二号宫殿遗址>，*《考古》*，03（1983），页 206-216. / Qanzhi Zhao, Guang Zheng, 'The Erlihous Site of the second palace in Yanshi, Henan., *Archaeology*, 03

(1983), pp. 206-216.)

Figure 116. Site plan of the No. 4 palace foundation at Yanshi Shang Site. (Source: 杜金鹏, <盘龙城商代宫殿基址讨论>, *《考古学报》*, 02 (2005), 页 161-182. / Jinpeng Du, 'Discussion on the Shang Dynasty Palace Site at Panlongcheng Site', *Acta Archaeologica Sinica*, 02 (2005), pp. 161-182.)

Figure 117. Photograph of the Panlongcheng Site. (Source: captured by the author)

Figure 118. Floor plan of the Panlongcheng F1 palace (Source: 杜金鹏，<盘龙城商代宫殿基址讨论>，*《考古学报》*，02（2005），页 161-182. / Jinpeng Du, 'Discussion on the Shang Dynasty Palace Site at Panlongcheng Site', *Acta Archaeologica Sinica*, 02 (2005), pp. 161-182.)

Figure 119. Illustration of the well-field system (Source: created by the author)

Figure 120. A speculative illustration of the hunting park landscape. (Source: hand-drawn by the author)

Figure 121. Zhanghuatai Palace Site - Elevated Architectural Structure. (Source: captured by the author)

Figure 122. Positioning diagram of the Zhanghuatai Site. (Source: recreated by the author, based on the ‘谭齐襄，*《中国历史地图集-第一册》*，（北京：中国地图出版社，1993），页 29-30. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 29-30’)

Figure 123. Aerial imagery of the surroundings of the Zhanghuatai archaeological site. (Source: captured by the author)

Figure 124. The topographic map of the Longwan archaeological site. (Source: recreated by the author, based on the ‘湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 11. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), p. 11.)

Figure 125. The topographic map of the Longwan archaeological site. (Source: recreated by the author, based on ‘湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 45. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I)*, (Beijing: Cultural Relics Publishing House, 2005), p. 45.)

Figure 126. Aerial photograph of the main buildings at the Zhanghuatai archaeological site. (Source: captured by the author)

Figure 127. The detailed diagram of the Zhanghuatai archaeological site. (Source:

captured and recreated by the author)

Figure 128. Shell Road Detailed Image. (Source: captured by the author)

Figure 129. The map encompassing the territories of the states of Chu and Wu. (Source: recreated by the author, based on the ‘谭齐襄，*《中国历史地图集-第一册》*，（北京：中国地图出版社，1993），页 29-30. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 29-30’)

Figure 130. Comparison diagram of the peak period of the Yunmengze lake cluster and its subsequent disintegration (Source: recreated by the author, based on the ‘谭齐襄，*《中国历史地图集-第一册》*，（北京：中国地图出版社，1993），页 45-46. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 45-46’; and ‘谭齐襄，*《中国历史地图集-第五册》*，（北京：中国地图出版社，1993），页 26-27. / Qixiang Tan, *The Historical Atlas of China – Volume 5*, (Beijing: China Cartographic Publishing House, 1993), pp. 26-27’)

Figure 131. Schematic Representation of Lake Reclamation and Decline in the Jianghan Plain (Source: 徐瑞瑚，谢双玉，赵艳，<江汉平原全新世环境演变与湖群兴衰>，*《地域研究与开发》*，4（1992），页 52-56. / Ruihu Xu, Shuangyu Xie, and Yan Zhao, ‘The Holocene environmental changes and the rise and fall of lakes in the Jianghan Plain’, *Areal Research and Development*, 4 (1992), pp. 52-56.)

Figure 132. Topographic Map of the Jingjiang Levees (Source: recreated by the author, based on the 荆州市长江河道管理局，*《荆江提防志》*，（北京：中国水利水电出版社，2012）. / Jingzhou Yangtze River Administration Bureau, *Annals of Jingjiang*

Levees, (Beijing: China Water & Power Press, 2012))

Figure 133. Two Patterns of Settlement Landscapes (Source: recreated by the author, based on Google Earth)

Figure 134. Aerial Drone Photography of Zhanghua Temple. (Source: captured by the author)

Figure 135. The Iron Pagoda at Yuquan Temple. (Source: captured by the author)

Figure 136. Photograph of the main entrance of the Xita Temple in contemporary times. (Source: captured by the author)

Figure 137. The landscape of the Xita Temple and the Jingling West Lake. (Source: captured by the author)

Figure 138. Photograph of the Wen Xue Well (Lu Yu Well) Ruins. (Source: captured by the author)

Figure 139. Photograph of the interior landscape of Baotong Temple. (Source: captured by the author)

Figure 140. Aerial photograph of the roof of Baotong Temple. *(Source:* Baotong Temple,

‘The scenery of the Baotong Temple’, *Baotong Temple*, 5 (2017), <https://www.baotongsi.com/bencandy.php?fid=156&id=2901> [accessed 19 March 2023].

Figure 141. Photograph of the landscape features of Baotong Temple. (Source: captured by the author)

Figure 142. Aerial photograph of the layout of Zhanghua Temple. (Source: captured by the author)

Figure 143. Photograph of the Agarwood Well taken in the late 1980s. (Source: The Standing Committee of Jingzhou Municipal People’s Congress, ‘The Controversy Surrounding the Name of the Agarwood Well’, *Jingzhou Daily*, 8 (2018), <http://www.jzrd.gov.cn/343/302.html> [accessed 11 March 2023].)

Figure 144. Photographs of Agarwood Wells and Ancient ginkgo tree from the Tang Dynasty. (Source: captured by the author)

Figure 145. Photograph of an ancient ginkgo tree from the Tang Dynasty. (Source: captured by the author)

Figure 146. Photograph of an ancient plum. (Source: captured by the author)

Figure 147. The distribution map of Buddhist pagodas in the Jianghan Plain during the Tang to Yuan dynasties. (Source: created by the author, use ArcMap, based on ‘中国

国家文物局主编,《*中国文物地图集(湖北分册)*》,(西安:西安地图出版社,2002),页 66-67. / Edited by the National Cultural Heritage Administration of China, *Cultural Relics Atlas of China (Hubei Volume),* (Xi'an: Xi'an Map Press, 2002), pp. 66-67.')

Figure 148. A photograph depicting the location of the Hongshan Pagoda. (Source: captured by the author)

Figure 149. Photograph depicting the intricate details of the stone eaves of Hongshan Pagoda. (Source: captured by the author)

Figure 150. The bronze pinnacle of the Hongshan Pagoda. (Source: captured by the author)

Figure 151: Illustrations of polder field in ancient texts. (Source: Zhen Wang (Yuan Dynasty), *Agricultural Book (Volume 5)*, National Digital Library of China. <http://read.nlc.cn/OutOpenBook/OpenObjectBook?aid=892&bid=359415.0> [accessed 16 January 2022].

Figure 152. Aerial imagery of the current state of the polder fields in the Jianghan Plain. (Source: captured by the author)

Figure 153. Map depicting the positional relationship between Paizhouwan Town and the Yangtze River. (Based on the Google Earth)

Figure 154. Satellite imagery analysis of the surrounding landscape of polder fields in Paizhouwan Town. (Source: Based on the Google Earth)

Figure 155. Poplar trees along the Yangtze River levee. (Source: capture by the author)

Figure 156. Photograph of the polder field landscape in the Paizhouwan Town. (Source: capture by the author)

Figure 157. Schematic representation of the village model in the Zoumaling Village, Shishou City. (Source: created by the author, based on the Google Earth)

Figure 158. Photographs of residential houses in the polder field area. (Source: capture by the author)

Figure 159. Diagram of residential courtyard housing. (Source: hand-drawn by the author)

Figure 160. Map of natural settlements in the Shahu region of eastern Mianyang during the Republican era. (Source: recreated by the author, based on the '鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 206. / Xiqi Lu, *The Human-Environment Relationship and Regional Society in the Middle Reaches of the Yangtze River*, (Xiamen: Xiamen University Press, 2016), p. 206.')

Figure 161. Aerial photograph of the polder field in the Jianghan Plain. (Source: capture

by the author)

Figure 162. Two patterns of settlement distribution. (Source: based by the Google Earth)

Figure 163. A remnant of a Qing Dynasty residential structure in the Jianghan Plain. (Source: capture by the author)

Figure 164. Aerial imagery of rural residential structures in the Jianghan Plain. (Source: capture by the author)

Figure 165. Satellite imagery of rural settlement distribution in the Jianghan Plain. (Source: created by the author, based on the Google Earth)

Figure 166. Satellite imagery of rural settlements along the banks of the Yangtze River. (Source: created by the author, based on the Google Earth）

Figure 167. Aerial photography of specific areas within Dayuwan Village. (Source: capture by the author)

Figure 168. The natural environment surrounding Dayuwan Village. (Source: capture by the author)

Figure 169. The GIS map of Dayuwan Village and the aerial imagery illustrating the

main street of Dayuwan Village. (Source: created and captured by the author use ArcGIS Pro and Drone)

Figure 170. The terraced landscape within Dayuwan Village. (Source: capture by the author)

Figure 171. Location map of Chengji Ancient Town. (Source: crested by the author, based on the Google Earth)

Figure 172. Distribution pattern of buildings along the water body. (Source: created by the author, use ArcGIS Pro)

Figure 173. Distribution patterns of buildings along both sides of the water body. (Source: created by the author, use ArcGIS Pro)

Figure 174. Photograph of the Hanyang Ironworks, 1906. (Source: Changjiang Daily, 'Visiting this photography exhibition evokes a century's worth of memories of urban life in Hanyang', *Official Website of Wuhan Municipal People's Government*, 2023. <https://www.wuhan.gov.cn/zjwh/whrw/202305/t20230526_2206378.shtml> [accessed 17 July 2023].)

Figure 175. Photograph of the Hanyang Ironworks, 1906. (Source: Xinhua News Agency, 'Over a century later, this area remains filled with 'treasures'', *New media of Xinhua News Agency*, 2021. <https://baijiahao.baidu.com/s?id=1717906704004624998&wfr=spider&for=pc> [accessed 18 July 2023].)

Figure 176. A photograph of the Shashi Customs Building (left) and the Tax Commissioner ' s Office (right), showcasing traditional Chinese and Western architectural styles, taken a century ago. *(Source:* Hubei Daily, 'Photographic Retrospective of Shashi Over the Past Century', Shashi District People's Government Official Website, 2024.
<http://www.shashi.gov.cn/ssqxw/ssyw/202406/t20240626_938802.shtml > [accessed 29 July 2024])

Figure 177. Aerial photograph of the Shashi trade port, taken in 1937. (Source: Hubei Daily, 'Photographic Retrospective of Shashi Over the Past Century', Shashi District People's Government Official Website, 2024.
<http://www.shashi.gov.cn/ssqxw/ssyw/202406/t20240626_938802.shtml > [accessed 29 July 2024])

Figure 178. Photographs of the existing main structure of Anli British Company (Arn hold Karbert & Co. Ltd). (Source: captured by the author)

Figure 179. British Concession in Hankou along the Yangtze River, 1867. (Source: John Thomson*, Illustrations of China and Its People,* (Guangxi: Guangxi Normal University Press, 2015), p. 373.)

Figure 180. Photograph of the street landscaping adjacent to Hankou trade port. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', Wuhan Jianghan District People's Government Official Website, 2021.
<https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])

Figure 181. Photograph of the Citibank Building, completed in 1921. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', *Wuhan Jianghan District People's Government Official Website*, 2021. <https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])

Figure 182. Photograph of the Jianghan Customs House, completed in 1924. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', *Wuhan Jianghan District People's Government Official Website*, 2021. <https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])

Figure 183. Photograph of the Hankou Trade Port landscape from 1920. (Source recreated by the author, based on the Tianyu Feng, Yong Chen, *Wuhan Images – In International Pespectives (1838-1938),* (Beijing: People's Publishing House, 2017).)

Figure 184. Photograph of the 1931 flood at the Hankou trade port. (Source: Wuhan Art Museum, 'Wuhan Art Museum Collection: A Century of Memories from Hankou—Photographs of the Hankou Concession')

Figure 185. GIS Analysis of Land Use Distribution in the Jianghan Plain Over the Past Thirty Years. (Source: created by the author, use ArcMap)

Figure 186. Changes in the reclamation of the lakes in the Jianghan Plain from 1950 to

1988. (Source: based on the ‘顾延生，李兇家，秦养民，祁士华，葛继稳，李伟，<历史时期以来人类活动与江汉湖群生态环境演变>,*《地球科学-中国地质大学学报》*，增刊 1（2013），页 133-144. / Yansheng Gu, Kuangjia Li, Yangmin Qin, Shihua Qi, Jiwen Ge, Wei Li, ‘Impact of Human Activity on the Evolution of the Ecological Environment of Jianghan Lake Group in the Historical Period, Central China’, *Earth Science – Journal of China University of Geosciences*, Suppl. 1 (2013), pp. 133-144.’)

Figure 187. Satellite imagery of the Renmin Dayuan State-owned Farm Region. (Source: based on the Google Earth)

Figure 188. Schematic representation of modular farmland. (Source: based on the Google Earth)

Figure 189. Aerial photographs of modular farmland in the Jianghan Plain. (Source: based on the ‘Pei Zhang, Tian Zhou, ‘Hubei is actively advancing the construction of large and medium-sized irrigation projects to enhance its agricultural irrigation and drainage systems.’, *People’s Daily*, 2022.
<http://hb.people.com.cn/n2/2022/0930/c406080-40146695.html>
[accessed 11 January 2023].’)

Figure 190. Primary settlement patterns within state-owned farms. (Source: created by the author, use ArcGIS Pro. Satellite imagery is sourced from Google Earth.)

Figure 191. Aerial photograph of terraced fields in the Jianghan Plain. (Source: captured by the author)

Figure 192. Aerial photograph of a simple storage facility in agricultural land. (Source: captured by the author)

Figure 193. Aerial photographs of agricultural fields and green spaces. (Source: captured by the author)

Figure 194. Aerial photograph of the plain platform model settlements in the Jianghan Plain. (Source: based on the '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 50. ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 50.')

Figure 195. Satellite imagery of the state-owned farm model settlements in the Jianghan Plain. (Source: based on the Google Earth)

Figure 196. Satellite imagery of the lake marsh polder field model settlements in the Jianghan Plain. (Source: based on the Google Earth)

Figure 197. Hand-drawn illustrations of the plain platform model settlements in the Jianghan Plain. (Source: hand-drawn by the author)

Figure 198. Aerial photograph of the plain platform model settlements in the Jianghan Plain. (Source: based on the '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：

科技出版社，2015），页：彩页 22 ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 22’)

Figure 198. Aerial photograph of the plain platform model settlements in the Jianghan Plain. (Source: based on the ‘湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 22. ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 22.’)

Figure 199. Satellite imagery of the ditch grid model settlements in the Jianghan Plain. (Source: based on the Google Earth)

Figure 200. Satellite imagery of the riverine model settlements in the Jianghan Plain. (Source: based on the Google Earth)

Figure 201. Satellite imagery of the hilly areas dispersed model settlements in the Jianghan Plain. (Source: based on the Google Earth)

Figure 202. The ‘Jianghan Scenic Views’ illustrated by Ying Qiu during the Ming Dynasty. (Source: Ying Qiu, ‘Jianghan Scenic Views’, *Wuhan Museum Official Website*, <http://whmuseum.com.cn/collection/painting/d7ac60f8f26fc24b0af377d593a4e4b9> [accessed 29 June 2022].)

Figure 203. Commemorative Postage Stamp of the Wuhan Yangtze River Bridge. (Source: Zhiwen He, 'One Bridge Spans North and South — A Historical Reflection on the Construction of the Wuhan Yangtze River Bridge', *National Museum of China Official Website,* 2022,

<https://www.chnmuseum.cn/zj/jzrgs/202207/t20220713_256740.shtml> [accessed 12 October 2022].)

Figure 204. Distribution Map of Cities in the Wuhan Metropolitan Area. (Source: created by the author, use ArcGIS Pro)

List of Tables

Table 1. Comparing Paleolithic Mammals in the Hubei Region (Source: recreated by the author. (Source: 杨宝成，*《湖北考古研究与发现》*，（武汉：武汉大学出版社，1995），页 3. / Baocheng Yang, *Archaeological Research and Discoveries in Hubei*, (Wuhan: Wuhan University Press, 1995), p. 3.)

Table 2. The sediment thickness and sedimentation rate of the Jianghan Plain during the Holocene epoch. (Source: 王张华，Liu J P, 赵宝成，<全新世长江泥沙堆积的时空分布及通量估算>，*《古地理学报》*，4（2007），页 419-429. / Zhanghua Wang, J P Liu, Baocheng Zhao, 'Spatial and temporal distribution of Changjiang sediments and estimation of sediment budget during the Holocene', *Journal of Palaeogeography*, 4 (2007), pp. 419-429.)

Table 3. Four archaeological periods in the Neolithic Age (Source: created by the author)

Table 4. A summary of the major cultural influences on the landscape of the Jianghan Plain throughout different historical periods. (Source: created by the author)

Table 5. The impact of climate variations and changes in the ancient Yunmengze Lake cluster on the landscape of the Jianghan Plain across different historical periods. (Source: created by the author)

Table 6. A comparative table of the Landscape Features and Human Activities in the Jianghan Plain across different historical periods. (Source: created by the author)

Declaration

I declare that this thesis has been solely authored by me and has not been submitted, in whole or in part, for any previous degree application. The work presented herein is entirely my own.

Table of Contents

Abstract **3**

Acknowledgements **4**

List of Figures **6**

List of Tables **40**

Declaration **41**

Chapter 1. Introduction **47**

Research Background 47

Research Area 50

Geographical location 50

Regional selection 51

Regional limitation 54

Literature Review 58

Methodology and Methods 69

Methodological background 69

Research methods 73

Time and space 75

Other factors 77

Research Aims, Objectives, and Questions 80

Thesis structure 82

Sources 84

Archaeological report 86

Ancient texts 86

Maps 87

The Annals of Hubei Province 88

Additional scholarly literature 88

Archives 89

Aerial imagery 89
Field investigation 90

Chapter 2. Original Landscapes: The Primordial Landscape of Human Origins 92

Introduction 92
As Modified by Physical Processes 93
Original landforms 93
Climate under the geographical division of Qinling 96
Vegetation 99
Ancient fauna 100
Lake cluster and wetlands 104
As Modified/Influenced by Human 114
The initial place of habitation 114
The earliest settlement 118
Conclusion 123

Chapter 3. Neolithic Age: The Landscape of Early Agriculture and Settlement Formation 125

Introduction 125
Early Agricultural Landscape 132
Soil and water quality 133
Paddy field 135
Other edible plants 145
Field pattern 149
Settlement of Ancient Ancestors 152
Site section 153
Patterns of settlements 167
Zoumaling Site 172
Large ancient city (central settlement) - Shijiahe ancient city 183
Residential buildings within settlements 199

Conclusion.....209

Chapter 4. The Bronze Age: Emergence of Diverse Landscapes in Cultural Integration 214

Introduction 216

Development of New Settlements.....220

Phase-wise evolution of spatial distribution.....221

Microtopography site selection 230

Two construction typologies.....233

Urban water systems.....236

Early Palace – Panlonghcheng Site Palace 245

Architectural layout of the palace.....245

Corridors.....249

Drainage facilities.....251

Appearance of palace architecture in the Panlongcheng site 253

Field Landscape.....254

The emergence of Royal Gardens.....260

Conclusion.....275

Chapter 5. From the Qin Dynasty to the Yuan Dynasty (221BC-1368): Hydrological Environment, Land Reclamation and Religious Landscapes.....280

Introduction 280

The Evolution of the Hydrological Environment.....283

Yunmengze's changes 283

Constructing embankments for land reclamation 285

Water conservancy embankments.....289

Ecological Adaptation Processes of Settlements 292

Before the Tang Dynasty 292

From the Tang Dynasty to the Yuan Dynasty 297

The Emergence of Buddhist Landscapes 300

Temple landscape 305

Pagoda 315
Conclusion 319

Chapter 6. From the Ming Dynasty to the Qing Dynasty (1368-1912): Stable Development of Aquatic Systems and Agricultural Landscapes 325

Introduction 325
Polder Agricultural Landscape 331
Morphology of polder field landscapes 332
Villages in polder fields 340
Polder field landscapes evolution 342
Rural Villages and Urban Towns 347
Construction patterns 348
Rural settlement morphology 355
Town settlement morphology 361
Conclusion 368

Chapter 7. Modern and Contemporary Period (1840-1949) - Influence of Industrialization and Urbanization 371

Introduction 371
The Early Factory 371
Construction of Trade Ports 376
Shashi trade port 377
Hankou trade port 379
The Impact of Modern Urbanization on Rural Landscapes 385
Conclusion 387

Chapter 8. Landscape after 1949 - Ecological Protection and Sustainable Development 390

Introduction 390
Transformation of Rural Landscapes 395
State-owned farms 396

Household contract responsibility system 401
Returning farmland to forests 405
Multiple settlement patterns 407
Urban Ascendance 417
Rural-Urban Fringe 419
Urban development in Wuhan 420
Metropolitan Area 424
Conclusion 426
Chapter 9. Discussion and Conclusion 430
Discussion 430
Conclusion 446
Suggestions and Recommendations for Future Research 449
Bibliography 452

Chapter 1. Introduction

Research Background

Throughout China's extensive history, its people have settled across various regions of this vast land. In some areas, human presence has left distinct marks, while in others, these traces have largely disappeared. China is an ancient civilization and a traditional agrarian society, where millennia of farming have continuously shaped the societal and cultural development of rural regions. The early Chinese agrarian societies adapted to and modified their environment according to their capabilities and needs, maintaining a relatively harmonious relationship with nature to address social and cultural issues. [1]

In recent decades, the country has undergone significant transformations, including the construction of dykes and dams, roads and bridges, and the establishment of factories. With the rapid advancement of modernization, traditional rural landscapes have undergone dramatic changes as urbanization has progressed. In the 21st century, the outflow of young labour from rural areas in pursuit of higher income in cities has led to rural depopulation, with farmers abandoning their land and issues such as ‘empty nesters’ and ‘left-behind children’ arising. This shift has exacerbated income inequality, as younger generations achieve greater earnings in urban areas. Extensive areas have been repurposed for urban infrastructure, altering their fundamental characteristics. Many large modern farms, including areas/lands from smaller farms and marginal land has been abandoned and is now overgrown, gradually reverting to forest. Concurrently, rural infrastructure is dissipating, concentrating instead in larger, more viable centres or towns.

[1] E. N. Anderson, The food of China, (London: Yale University Press, 1988).

Clearly, the development of urban and rural areas in China is undergoing a dramatic transition. This shift is not only related to the concept of traditional agricultural production but also to the rich and diverse cultural landscapes and heritage. The latter has received limited attention so far: without efforts to preserve rural areas, societal culture and heritage may gradually disappear with the passing of the older generations.

In the decades preceding China's reform and opening-up, architectural styles in China were relatively uniform, and the landscapes of new cities exhibited significant similarities. In nearly all expanding cities, one could observe the following predominant urban elements: residential areas constructed of red bricks arranged in geometric patterns, and large factories with international characteristics situated in specific locations within the city. [2] Although these new urban elements were functional, they were not aesthetically pleasing. After 1978, following the reform and opening-up, a substantial influx of capital into the real estate sector led to the rapid emergence of diverse new architectural complexes over the past thirty years, resulting in a dramatic transformation of urban landscapes. For long-time residents, however, the city began to feel unfamiliar, with old buildings and neighbourhoods gradually disappearing, and new structures standing in their place. Consequently, the significance of the urban environment has shifted, leading to a growing call for the preservation of regional historical and cultural landscapes.

Landscapes embody both natural and cultural dimensions; they reflect historical layers and the immediate present, encapsulating the emotions of contemporary inhabitants as well as the cultural remnants left by previous generations over millennia. They are the most tangible representation of a place, a people, a nation, or a civilization. The public value of landscapes lies in their role as symbols of national culture and identity. It is

[2] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 204. / Yi-Fu Tuan, *Shenzhou – A historical geography of China*, (Beijing: Peking University Press, 2023), p. 204.

crucial to enhance national identity by fostering an awareness of landscape history through the study of regional landscape development. Historical experiences not only evoke reflection but also hold cultural significance. For instance, what the French refer to as 'pays ',[3] or regional landscapes, can deepen one's appreciation and understanding of the homeland and nation.

Preserving rural heritage is vital for maintaining national and regional pride. While scholars have attempted to capture the macro changes in landscapes through assessments of their characteristics, such approaches often fail to reveal subtle changes and thus do not effectively reflect the nuanced interactions between people and land. Understanding what constitutes rural heritage and recognizing what we possess are essential for articulating heritage protection priorities. The various landscapes described by Hoskins in his study of the English countryside, continually shaped by generations, stand as enduring testimonies to the natural and cultural spirit of past rural societies. Features such as fences, pathways, villages, churches, towns, and buildings can serve as historical subjects for recounting stories and documenting the landscape history of England. In this research context, examining the formation and development of Chinese landscapes is equally necessary. By integrating natural landforms with cultural landscapes and transforming visible landscapes into readable texts, it becomes possible to shape these cultural and natural elements into components of national cultural heritage and collective memory. Connecting economic, social, and artistic dimensions with this process will contribute significantly to the public value of national history. [4]

[3] Matthew Johnson, *Ideas of Landscape*, (Oxford: Blackwell, 2007), pp. 34 − 69.

[4] David Hooson, *Geography and national identity,* (Oxford: Blackwell Publishers, 1994), pp. 15-38.

Research Area

Geographical location

If one examines a three-dimensional map of China, it becomes evident that the country's topography exhibits a chequerboard pattern (Figure 1). In China, the western regions are characterized by an alternating distribution of high plateaus and basins, separated by prominent, elongated mountain ranges. In contrast, the chequerboard pattern is less pronounced in the eastern regions, though some areas are clearly evident. For instance, the distinct Northeast Plain, North China Plain and the Yangtze River Plain in the middle and lower reaches of the Yangtze River are noticeable examples. These major plains form a band extending from northeast to southwest, divided into three distinct units separated by the Rehe Plateau and the Dabie Mountains. The surface features of these plains vary significantly. The northernmost, the Northeast Plain, is covered by an erosion layer, resulting in good water permeability and slight undulations, rather than a flat terrain. The central North China Plain is characterized by continuous alluvial deposits and is relatively flat. It slopes gently toward the sea, and in the not-so-distant past, much of the area was either seasonally submerged or had poor water permeability. Flooding in the North China Plain has historically caused prolonged economic hardship for farmers due to slow drainage. Generally, the plain appears brown, arid, and parched, particularly on windy and dusty winter days, with summer rainfall

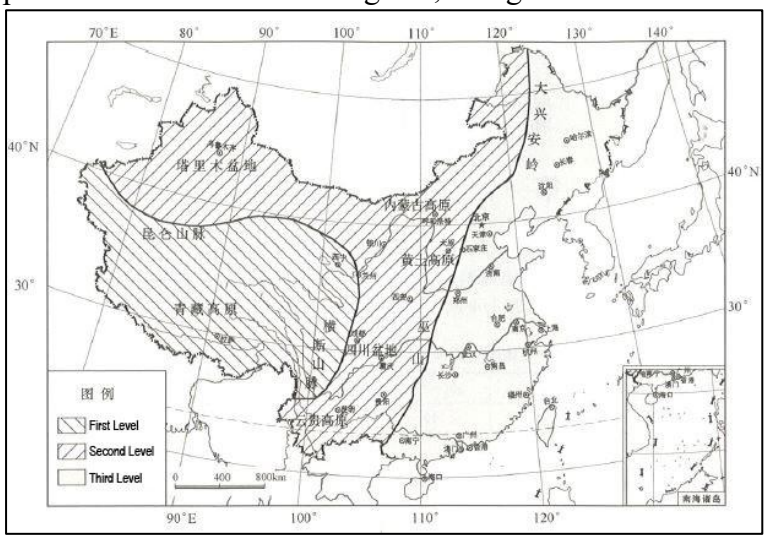


Figure 1. The Three Major Stages of Chinese Landforms (Source: 尤联元，杨景春，*中国地貌*，(北京：科学出版社，2013)，页 2. / Lianyuan You, Jingchun Yang, *Chinese landform*, (Beijing: China Science Publishing, 2013), p. 2.

sufficient only for drought-resistant crops. Among these three plains, the southernmost Yangtze River Plain is the most humid, with the lowest elevation, comprising the lake basins of the middle and lower Yangtze River. Standing on the shores of Dongting Lake or Poyang Lake, one might easily imagine oneself by the sea. The study area of this paper, the Jianghan Plain, is an integral part of the Yangtze River Plain, one of China's three major plains.

Regional selection

The Jianghan Plain, located in Hubei Province, China, is situated within the Jianghan Basin in the central Yangtze River valley. This region is a lacustrine plain formed through the combined effects of the Yangtze River, the third-largest river in the world, and its major tributary, the Han River. [5] The nomenclature of this area is derived from these rivers, and the historical development of its landscape merits thorough investigation and detailed documentation.

From the perspectives of geography and ecological value, this region exhibits a rich and diverse array of ecosystems, including lakes, rivers, and wetlands, which provide habitat for numerous species. The Jianghan Plain is situated in the subtropical monsoon climate zone, characterized by pronounced seasonal variations, abundant rainfall, relatively ample sunshine and fertile soils. [6] These conditions foster vigorous plant growth and a rich diversity of animal life. The Jianghan Plain, located in the middle reaches of the Yangtze River, benefits from its unique geographic position. The extensive river network, including the Yangtze River and its tributaries, has

[5] 湖北省地方志编纂委员会,*《湖北省志.自然综述》*,(武汉:湖北人民出版社,2020), 页 71./ Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province - Natural Review,* (Wuhan: Hubei People' Press, 1994), p. 71.

[6] Guoyu Ren, Hans-Juergen Beug. 'Mapping Holocene pollen data and vegetation of China', *Quaternary Science Reviews*, (21) 2002, pp. 1395-1422.

significantly influenced the region's geomorphology and ecology.

From the perspectives of historical and cultural value, the Jianghan Plain stands as a significant cradle of human civilization, with a rich historical and cultural heritage. This region is among the earliest sites of human habitation on the Chinese mainland, dating back to the primitive society era. Archaeological evidence indicates that as early as the late Palaeolithic period, approximately 20,000 to 10,000 years ago, there were signs of ancient human settlement and activity on the Jianghan Plain. [7] The area has yielded substantial archaeological and historical research findings which support ongoing historical landscape studies.

The Jianghan Plain is characterized by its distinctive regional culture. Historically, it has been a crucial area for population migration in China. Due to its fertile land and strategic significance, several major population movements have occurred here. The cultural interactions resulting from these migrations have blended with the local indigenous cultures, giving rise to a new regional culture with unique characteristics. For instance, during the Spring and Autumn and Warring States periods, the formation of Chu culture was a product of diverse cultural interactions and integrations. This culture not only preserved local distinctiveness but also incorporated elements from the Central Plains and surrounding ethnic groups, creating a distinctive and diversified cultural system. The interplay between landscape development and cultural transmission in this region provides valuable insights into the formation and evolution of regional culture, thus offering support for cultural preservation and continuity.

In terms of agricultural and economic value, the Jianghan Plain has significant

[7] 刘德银，王幼平，<鸡公山遗址发掘初步报告>，*《人类学学报》*，20（2001），页 102-114./ Deyin Liu, Youping Wang, 'A preliminary report on the excavation of Jigongshan Site', *Acta Anthropologica Sinica,* 20 (2001), pp. 102-114.

importance. This region is a major agricultural area in China due to its rich ecosystem, which provides essential support for human settlement and agricultural development. Agriculture has been of substantial importance in this area, and it continues to be one of China's key agricultural regions. Studying the landscape development history can illuminate the evolution of agricultural landscapes and offer insights into enhancing agricultural sustainability.

In summary, the landscape development history of the Jianghan Plain holds significant value in terms of geography, ecology, history, culture, agriculture, and economics. The formation and evolution of landscapes within this region not only reflect China's natural geographical and cultural diversity but also exemplify general patterns of socio-economic development and environmental change. Studying the Jianghan Plain offers a targeted examination of the evolving relationship between humans and nature within the area, enabling the synthesis of the historical landscape evolution process. This approach facilitates a deeper understanding of the formation and overall development trends of the region's landscape. Consequently, it is a region highly deserving of thorough research.

It is important to note that different regions exhibit distinct natural environments, population densities, production methods, and cultural differences. These cultural variations are closely tied to long-standing human activities, suggesting that they are the outcomes of historical development. More significantly, these differences largely represent a continuation of the past, with their traces being more pronounced in historical contexts than in contemporary ones. This phenomenon is particularly evident across China's vast territory, where inter-regional and inter-provincial variations are marked. Even in rural travel, one can easily observe changes in natural conditions, settlement patterns, and the colours of clothing, villages, and fields every few dozen kilometres. The variations in forested slopes, bamboo-shrouded homesteads, cultivated

fields, and village sizes reflect the distinct characteristics of local populations in terms of production, lifestyle, social customs, and culture. Such regional differences and local characteristics become readily apparent even without in-depth investigation. So for this study, investigating the landscape history of the entire country would require considerable resources, far beyond the scope of a doctoral research project. Consequently, this paper will focus on the Jianghan Plain as a case study. The research process and findings will serve as a representative example for landscape studies in plain regions and provide valuable insights for exploring the landscape formation of other regions in China.

Regional limitation

The current administrative divisions in China have evolved over thousands of years of historical development. However, at each historical stage, these administrative boundaries have been in a state of dynamic change. Consequently, using contemporary administrative divisions or those from a specific historical period as the scope for studying historical landscapes, while preserving some degree of historical continuity, often disrupts the integrity of historical geographical units and fails to objectively reflect the evolutionary patterns of regional historical landscapes. To ensure the historical and geographical integrity of the research area, this study has chosen to

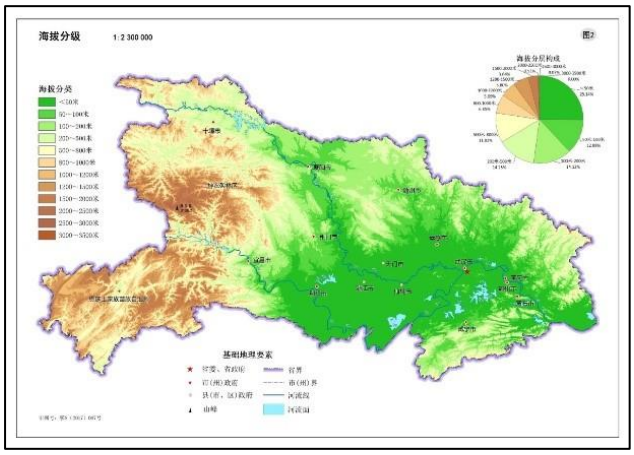


Figure 2. slope classification. (Source: The Office of the Leading Group for the First National Geographic Conditions Census in Hubei Province, 'Topography and landforms (including the elevation classification across the province, slope classification, and the area composition and spatial distribution of landform types)', Department of Natural Resources of Hubei Province, 2017, <https://zrzyt.hubei.gov.cn/bmdt/ztzl/hbsdycqgdlgqpcgb/gbfb/201910/t20191031_209613.shtml> [accessed 10 December 2020])

delineate the study area of the Jianghan Plain based on topographical features. In 2017, the Department of Natural Resources of Hubei Province published two topographic maps on its official government website, based on a 10-metre resolution digital elevation model. [8] One map shows elevation classifications (Figure 2), and the other shows slope classifications (Figure 3). Analysis of these maps reveals that, in areas with an elevation of less than 50 metres, the majority of the land features flat terrain, indicative of typical plain morphology. At the 50-metre elevation boundary, there are some areas with relatively gentle slopes and rolling hills, representing the foothill topography. Beyond 50 metres in elevation, the terrain transitions to steep and very steep slopes.

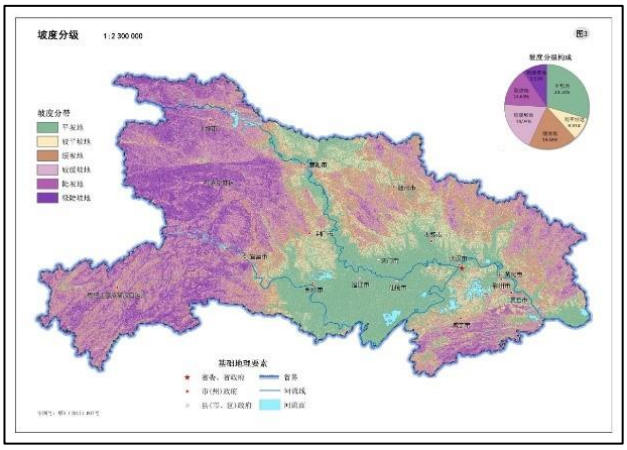


Figure 3. landform type (Source: The Office of the Leading Group for the First National Geographic Conditions Census in Hubei Province, 'Topography and landforms (including the elevation classification across the province, slope classification, and the area composition and spatial distribution of landform types)', Department of Natural Resources of Hubei Province, 2017, <https://zrzyt.hubei.gov.cn/bmdt/ztzl/hbsdycqgdlgqpcgb/gbfb/201910/t20191031_209613.shtml> [accessed 10 December 2020])

The Gazetteer of Hubei Province - Natural Review, provides a description of the Jianghan Plain:

> The Jianghan Plain is primarily located within the Yangtze-Huai River Tectonic Block and the Jianghan Fault Basin. It is characterized by a low and flat topography, except for gentle uplands along the edges at approximately 50

[8] Hubei province's first national geographical national census team, 'Topography and landform (altitude classification, slope classification and area composition and spatial distribution of landform types in the province)', Department of Natural Resources of Hubei Province Online (2017) <https://zrzyt.hubei.gov.cn/bmdt/ztzl/hbsdycqgdlgqpcgb/gbfb/201910/t20191031_209613.shtml> [accessed 17 January 2022].

metres above sea level and low hills reaching over 100 metres. The elevation throughout the plain generally remains below 35 metres, making it one of the lowest plains in China, with a total area of approximately 46,000 square kilometres. [9]

Thus, this study defines the scope of the Jianghan Plain as the region within the 50-meter contour line in Hubei Province. This boundary definition considers the scientific accuracy of the geomorphological features, the adaptability of administrative boundaries, and the focus of the research objectives. From a geomorphological perspective, although most traditional Chinese literature typically defines "plains" based on an elevation of 200 meters above sea level, the Jianghan Plain, as a typical low-lying area formed by the alluvial deposits of the Yangtze and Han Rivers, has a core region with an elevation generally below 30 meters. The use of the 50-meter contour line effectively excludes non-plain geomorphological units, such as the plateaus in northern Hubei and the hills in southeastern Hubei, through GIS spatial analysis for precise boundary delineation (Figure 4). This standard aligns closely with the regional characteristics of "low-lying terrain and dense river networks," avoiding the neglect of micro geomorphological variations inherent in macro definitions. For instance, the erosion and accumulation terraces in central Hubei, with elevations ranging from 50 to 200 meters, exhibit significant differences in hydrological and ecological processes from the core plain area due to the higher degree of surface incision and lower water system density.

[9] 湖北省地方志编纂委员会,*《湖北省志.自然综述》*,(武汉:湖北人民出版社,2020)，页 71./ *Compilation Committee for Local Chronicles of Hubei Province, The Gazetteer of Hubei Province - Natural Review*, (Wuhan: Blackwell Publishers, 1994), pp. 15-38.

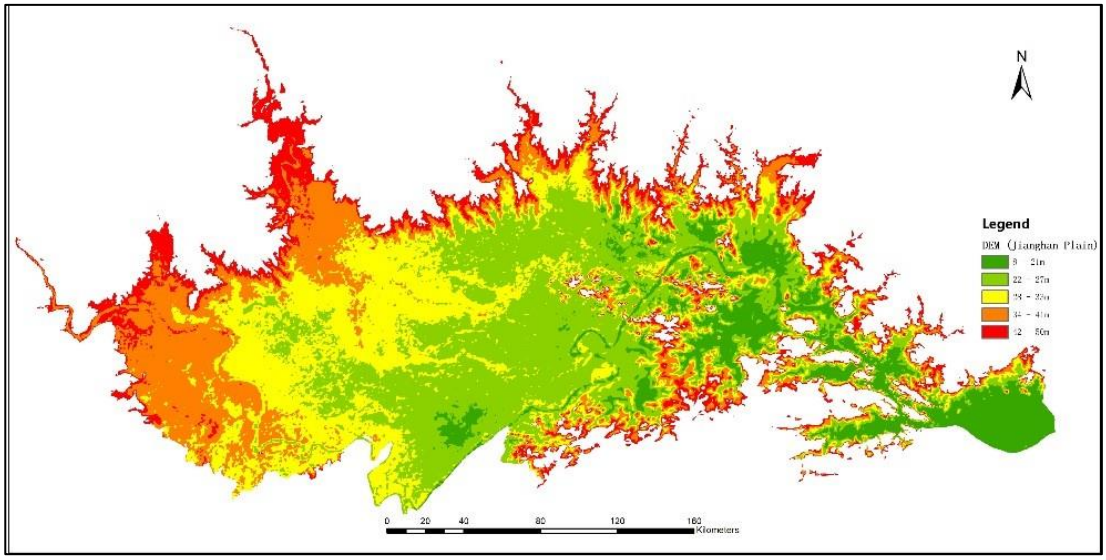


Figure 4. Digital Elevation Model (DEM) data elevation simulation map of the Jianghan Plain (Source: created by the author)

At the administrative level, this study adopts the current administrative boundaries of Hubei Province as the southeastern limit. This approach is chosen partly because the Jianghan Plain (Hubei section) historically and culturally belongs to the core area of Chu culture, and the stability of administrative boundaries helps ensure the continuity of regional studies. Additionally, it facilitates the integration of provincial-level statistical data (such as the *Hubei Statistical Yearbook* (*《湖北省统计年鉴》*) and *Hubei Water Resources Plan of Hubei Province* (*《湖北省水资源规划》*)), focusing on policy coordination within the same governance unit. It should be noted that if the 50-meter contour line intersects with administrative boundaries (such as the lakeshore area spanning Hunan and Hubei), the study will prioritize the integrity of geomorphological units. Only regions within Hubei Province that meet the elevation criterion will be included in the research scope.

By defining the Jianghan Plain region within an elevation range of no more than 50 meters, it is possible to identify and integrate areas that exhibit typical plain landform characteristics, characterized by relative flatness. Therefore, the 50-meter contour line within Hubei Province will serve as the boundary for this study, delineating the scope of the Jianghan Plain region (Figure 5).

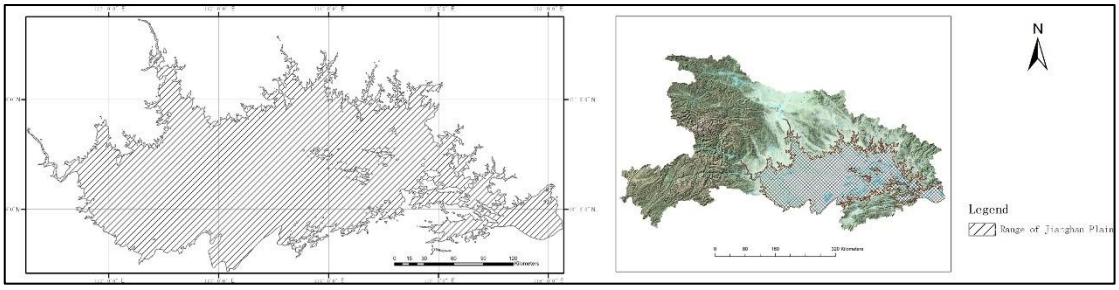


Figure 5. the geographical expanse of the Jianghan Plain (Source: created by the author)

Literature Review

In the academic trajectory of global landscape studies, the Jianghan Plain has become a pivotal locus for investigating human-environment relationship evolution, owing to its unique natural geographic endowments and profound historical-cultural heritage. Existing research has largely centred on core issues regarding the formation and development of the Jianghan Plain's landscape, yielding significant contributions across multiple dimensions. However, an evident imbalance persists in addressing key scientific questions. Substantial progress has been made in analysing landscape characteristics and the mechanisms of human-natural interactions. For example, *New Bamboo Slips and the Reconstruction of the Settlement Landscape System of Jianghan Plain* evidence to systematically reconstruct the spatial configuration of settlements during the Warring States, Qin, and Han periods, revealing the symbiotic relationship between land-water transportation networks and urban-rural settlement systems. [10] Similarly, *On Landscape Pattern and Biodiversity in Rural Areas of Jianghan Plain – Taking Two Villages as A Case Study* employs longitudinal case studies to quantify the evolution of agricultural landscape patterns and their ecological impacts. [11]

[10] 郭涛，<新出简牍与江汉聚落景观体系的重建>，*《华中师范大学学报（人文社会科学版）》*，4（2018），页 138-146 / Tao Guo, 'New Bamboo Slips and the Reconstruction of the Settlement Landscape System of Jianghan Plain', *Journal of Central China Normal University (Humanities and Social Sciences)*, 4 (2018), pp. 138-146.

[11] 宇振荣，谷卫彬，胡郭孝，<江汉平原农业景观格局及生物多样性研究——以两个村为例>，*《资源科学》*，2（2000），页 19-23 / Yuzhen Rong, Weibin Gu, and Guoxiao Hu, 'On Landscape Pattern and Biodiversity in Rural Areas of Jianghan Plain – Taking Two Villages as A Case Study',*Resources Science*, 2 (2000), pp. 19-23.

In foundational research on the natural environment, *The Terrain and Climatic Change of Jianghan Plain since Holocene* uses geological coring and paleoclimate reconstruction techniques to unveil regional geomorphological transformations since the Quaternary period. [12] Additionally, *Analysis of the Spatial and Temporal Evolution and Driving Factors of Landscape Ecological Risk in the Four Lakes Basin on the Jianghan Plain, China* systematically examines landscape ecological risk dynamics under the interplay of natural and anthropogenic factors through spatial analysis models.[13]

However, current studies still face substantial theoretical and practical gaps in methodological integration, landscape change driving mechanisms, and long-term research design. Methodologically, *Research on Settlements in the Jianghan Region During the Xia and Shang Dynasties from a Landscape Archaeology Perspective* attempt to construct an interdisciplinary framework but has yet to resolve key issues such as data integration accuracy and temporal-spatial scale unification, particularly lacking methodological adaptability for long-term studies. [14] In ecological environmental impact research, *Analysis of Land Use and Cover Change in the Jianghan Plain Based on Landscape Pattern Indices* focuses predominantly on contemporary landscape conditions, failing to provide in-depth analysis of ecosystem dynamics across centuries or millennia, thus lacking models for long-term ecological evolution. [15] Cultural heritage conservation research generally suffers from

[12] Sisi Chen, Xiongfei Wang, 'The Terrain and Climatic Change of Jianghan Plain since Holocene', *Geographical Science Research*, 2014 (2014), pp. 39-45.

[13] Ying Xia, Jia Li, Enhua Li, and Jiajia Liu, 'Analysis of the Spatial and Temporal Evolution and Driving Factors of Landscape Ecological Risk in the Four Lakes Basin on the Jianghan Plain, China', *Sustainability*, 15 (2023), https://doi.org/10.3390/su151813806.

[14] 邹秋实，*《景观考古视角下江汉地区夏商时期聚落研究》*，（武汉：武汉大学出版社，2023） / Zouqiu Shi, '*Research on Settlements in the Jianghan Region During the Xia and Shang Dynasties from a Landscape Archaeology Perspective*', (Wuhan: Wuhan University Press, 2023).

[15] 周玲玲，<基于景观格局指数的江汉平原土地利用覆盖时空变化分析>，*《安徽农业科学》*，11（2016），页

underdeveloped theory, with no comprehensive preservation strategy balancing historical continuity and modern functional needs, hindering the revelation of cultural heritage survival and transformation across long landscape evolution periods.

Notably, contemporary landscape research faces new methodological challenges. Despite landscape feature assessment becoming the mainstream paradigm over the past 25 years due to its standardized processes and quantitative advantages, this approach often oversimplifies human-environment complexity, proving inadequate for capturing nuanced interconnections—especially in long-term studies requiring precise representation of historical continuity and dynamic evolution. As noted in some studies, this fashionable evaluative method lacks the granularity to deeply understand complex, evolving human-land interactions. Against this backdrop, this study draws on Hoskins' classical methodology in *The Making of the English Landscape*, returning to historically grounded rural survey approaches. [16] By integrating archival research with field investigations, it systematically organizes outdoor landscape spatial patterns, combining historical planning maps and documentary records to construct a bidirectional, mutually validating framework between historical texts and contemporary field conditions. This mixed-methods approach enables deeper investigation of early land development processes and their temporal dynamics, particularly suited for analysing the 'continuity' and 'discontinuity' of landscape evolution over extended periods, providing a robust methodological foundation for revealing the full 'making' process of the Jianghan Plain landscape. These research gaps not only limit theoretical advancements in Jianghan Plain landscape studies but also hinder their application in regional sustainable development practices, highlighting critical academic directions and innovation areas for future research, especially in strengthening long-term theoretical construction and empirical analysis.

304-306 / Lingling Zhou, 'Analysis of Land Use and Cover Change in the Jianghan Plain Based on Landscape Pattern Indices', *Journal of Anhui Agricultural Science*, 11 (2016), pp. 304-306.

[16] W. G. Hoskins, the making of the English landscape, (Dorset: Little Toller Books, 2014).

Hoskins' landscape research establishes a multidimensional framework integrating vertical and horizontal dimensions. Vertically, his inquiry spans England's entire historical spectrum from prehistory to the modern era, addressing landscape evolution across eras. Horizontally, he comprehensively explores rural, urban, and other landscape forms, always taking landscape history as the research core. Within this framework, he pioneered a problem-oriented historiographical analysis model, examining not only landscape origins and trajectories but also uncovering the logical relationships behind landscape history and the deep human-environment interaction mechanisms. Specifically, beyond identifying initial settlement spatial forms, it is necessary to explore their symbolic meanings within social-historical contexts. To explain landform differences, beyond natural geographic factors like topography and climate, historical institutional analyses—including property systems and inheritance laws—must be integrated, situating landscape phenomena within a dual explanatory framework of social and legal history. [17]

Guided by a strong inquisitive spirit, Hoskins' landscape history analysis adheres to historical thinking, with research questions deeply rooted in historical academic traditions. As he emphasized:

> One cannot understand the English landscape and enjoy it to the full, apprehend all its wonderful variety form region to region (often within the space of a few miles), without going back to the history that lies behind it. [18]

Treating landscapes as historical texts, this approach deconstructs their material representations to reveal embedded historical narrative logic, establishing profound interpretive connections between landscape physicality and historical temporality.

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[17] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014).

[18] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), p. 14.

Hoskins also stressed integrating documentary research with field surveys in landscape history writing. [19] He proposed that analysing landscape formation requires a layered perspective through time-space dimensions—each generation imprints the landscape while preserving earlier traces. This overlap of old and new characteristics demands a two-way corroborative approach in both archival research and on-the-ground investigation.

Hoskins' interdisciplinary historical geography methodology holds significant relevance for analysing Jianghan Plain landscape development. From a long-term historical view, Neolithic settlements in the region were often located near water sources on high ground, reflecting early human adaptation to the natural environment—the beginning of human influence on regional landscape formation. Later, embankment construction and land reclamation altered landforms and waterways, while irrigation systems further reshaped the landscape. Modern agricultural colonization and industrial development have restructured landscape patterns. Hoskins' detailed landscape examination applies equally to the Jianghan Plain, where topographic-settlement relationships are intricately woven. Canals and field roads not only served agricultural needs but also embodied deep agricultural cultural traditions; studying such details can reveal rich cultural and socioeconomic roots. Moreover, Hoskins' context-based landscape interpretation is crucial for linking landscapes to local sociocultural factors, enabling comprehensive understanding of landscape formation narratives and facilitating the development of a research model tailored to the Jianghan Plain's realities.

For example, in his study of Hatfield Park in Hertfordshire, Hoskins used documentary review and field surveys to reveal that while the park took its present form in the 19th

[19] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), p. 14.

century by merging two ancient hunting parks, traces of the 13th-century parks (originally converted from woodlands) remain discernible in its structure. [20] This integration of textual research and spatial analysis allows landscape history studies to transcend surface phenomena, uncovering the construction logic of different eras within layered historical traces, precisely capturing landscape evolution's chronological sequence and social context, and delving into historical details' implications.

Chinese scholars have selectively adopted Hoskins' methodologies while critically reflecting on their applicability within China's historical context. This adaptation's values and limitations exhibit complex dialectics, analysable from two aspects:

1. Methodological Borrowing: Localization of Problem Awareness and Analytical Tools

a. Epistemological Shift of 'Landscape as Historical Text'

Hoskins' concept of landscapes as 'readable historical texts' has inspired Chinese scholars to decode social transformation logic through spatial forms. For instance, in *From 'Borderlands' to 'Upstream': The Evolution of the Modern Lanzhou Yellow River Landscape Theme,* Zhang views landscapes as 'rewritings of history', emphasizing the exploration of landscape historical layering. [21] Using Lanzhou's Yellow River landscape evolution as a case, he analyses landscape elements' historical accumulation and shifting meanings while developing methodologies suitable for Chinese landscape history research. [22] Mei, in *Through the Lens of Landscape: On English Historian*

[20] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), pp. 89-90.

[21] 张景平，<从“边塞”到“上游”:近代兰州黄河景观主题的演化——兼论中国景观史研究的一个方法问题>，*《清华大学学报（哲学社会科学版）》*，3（2023），页 140-156 / Jingping Zhang, 'From 'Borderlands' to 'Upstream': The Evolution of the Modern Lanzhou Yellow River Landscape Theme', *Journal of Tsinghua University (Philosophy and Social Sciences)*, 3 (2023), pp. 140-156.

[22] 张景平，<从“边塞”到“上游”:近代兰州黄河景观主题的演化——兼论中国景观史研究的一个方法问题>，*《清华大学学报（哲学社会科学版）》*，3（2023），页 140-156 / Jingping Zhang, 'From 'Borderlands' to

William Hoskins' Devotion to the Local and His Engagement with Public History, analysing his reinterpretation of English landscapes and public history dissemination methods, which offer theoretical references for cross-cultural transmission and public participation in Chinese landscape history studies. [23]

b. Adaptive Reconfiguration of Interdisciplinary Frameworks

Hoskins' 'History + Geography + Archaeology' interdisciplinary approach inspires Chinese scholars to integrate diverse historical sources. Xu, in *Cultural Landscape Protection in Southwest China's Poverty-Stricken Rural Areas*, adopts Hoskins' 'landscape dynamic sedimentation' framework to analyse southwest rural settlements' natural, ethnic, and policy interactions, extending his 'gradual continuity' model to accommodate modern policy interventions like poverty alleviation and ecological governance. [24] Gao systematically reviews Hoskins' research paradigm in his journal paper, highlighting its significance for Chinese local history studies through interdisciplinary integration of historical geography and archaeology. [25]

c. Long-Term and Local Contextual Analysis

Hoskins' 'prehistoric-to-modern' long-term tracking resonates with Chinese scholars' 'big history + small places' paradigm. Zhao, in *The 'histories' and 'history': The Concepts, Methods and Practices of Regional Social History*, uses fieldwork and folk

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'Upstream': The Evolution of the Modern Lanzhou Yellow River Landscape Theme', *Journal of Tsinghua University (Philosophy and Social Sciences)*, 3 (2023), pp. 140-156.

[23] 梅雪芹，<以景观为媒——英国史学家威廉·霍斯金斯的乡土情怀及公众史学实践探析>，*《史学理论研究》*, 6（2020），页 111-121 / Xueqin Mei, 'Through the Lens of Landscape: On English Historian William Hoskins' Devotion to the Local and His Engagement with Public History', *Historiography Bimonthly*, 6 (2020), pp. 111-121.

[24] 徐青，*《西南贫困地区乡村文化景观保护与发展》*,（北京：中国社会科学出版社，2021） / Qing Xu, *'Cultural Landscape Protection in Southwest China's Poverty-Stricken Rural Area'*, (Beijing: China Social Sciences Press, 2021).

[25] 高岱，<威廉·霍斯金斯与景观史研究>，*《学术研究》*，12（2017），页 103-107 / Dai Gao, 'William Hoskins and Landscape History Research', *Academic Research*, 12 (2017), pp. 103-107.

document analysis to explore ordinary people's histories and their relationship to macro-level historical processes. [26] Li's employs long-term regional analysis of population, technology, and market factors to trace economic landscape evolution, aligning with Hoskins' methods of uncovering historical drivers behind landscape changes. [27]

2. Critical Reflections: Cultural Specificity and Incommensurability

a. Challenge to 'Gradual Accumulation' Theory

Hoskins' emphasis on landscape evolution's 'continuity' is challenged by Chinese scholars who note that dynastic cycles and institutional ruptures often cause violent reconstructions. Lu's study of the Jianghan Plain's transition from 'official embankments' to 'folk embankments' during the Taiping Rebellion (1851-1864) demonstrates how governance vacuums led to landscape 'systemic ruptures', questioning Hoskins' gradualism. [28]

b. Revision of 'Individual Property-Centred' Models

Contrasting with Hoskins' focus on individual property rights (e.g., Enclosure Movement), Chinese scholars emphasize collective clan actions and state power. Wang's study of Fujian clan settlements reveals ancestral tombs and halls as spatial expressions of clan authority, reflecting a 'collective memory – spatial symbolism' logic.

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[26] 赵世瑜，*《小历史与大历史：区域社会史的理念、方法与实践》*，（北京：生活·读书·新知三联书店，2006）/ Shiyu Zhao, *The 'histories' and 'history': The Concepts, Methods and Practices of Regional Social History*, (Beijing: SDX Joint Publishing Company, 2006).

[27] 李伯重，*《江南的早期工业化（1550-1850）》*，（北京：社会科学文献出版社，2000） /Bozhong Li, *Early Industrialization in the Area South of the Yangtze River (1550—1850)*, (Beijing: Social Sciences Academic Press (China), 2000).

[28] 鲁西奇，*《人群·聚落·地域社会：中古南方史地初探》*，（厦门：厦门大学出版社，2012） /Xiqi Lu, *People, Settlements and Regional Society: Preliminary Studies on the History and Geography of Southern China in the Middle Ages*, (Xiamen: Xiamen University Press, 2012).

[29] He's research on 'village consolidation' highlights state-led 'administrative leadership – spatial reconstruction' dynamics, requiring analysis of institutional factors like urban-rural dualism, beyond Hoskins' 'local society' perspective. [30]

c. Transcending the 'Text-Centered Approach'

Hoskins' reliance on textual sources (e.g., land deeds) is supplemented in Chinese studies by non-textual memories. Zhang's analysis of Lanzhou's Yellow River landscape uses Qing Dynasty paintings (Painting of the Floating Bridge on the Yellow River in Lanzhou （黄河兰州浮桥图）) and historical maps to reconstruct spatial layouts, revealing interconnections between landscape forms, military defence, and commerce—dimensions harder to capture in Hoskins' text-centric model. [31]

Thus, Hoskins' conceptualization of England's landscape 'narrative' features—rooted in its sociopolitical-economic context—cannot be directly applied to culturally distinct regions like the Jianghan Plain. For example, England's manor-centric land model may be irrelevant where land tenure systems and agricultural traditions differ. Reassessment through thorough analysis of local historical development and human-environment interactions is crucial to identify indigenous landscape-shaping factors, considering cultural values like China's agricultural civilization and clan structures. Inadequate evaluation risks misinterpretation, while rigorous adaptation—extracting universal

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[29] 王铭铭，*《村落视野中的文化与权力——闽台三村五论》*，（北京：商务印书馆，2021） /Mingming Wang, *Culture and Power in the Perspective of Villages: Five Discussions on Three Villages in Fujian and Taiwan*, (Beijing: The Commercial Press, 2021).

[30] 贺雪峰，*《乡村的视角：乡村振兴与共同富裕若干问题解读》*，（北京：大有书局，2024） /Xuefeng He, *The Rural Perspective: Interpretations of Several Issues in Rural Revitalization and Common Prosperity*, (Beijing: Dayou Bookstore, 2024).

[31] 张景平，<从“边塞”到“上游”:近代兰州黄河景观主题的演化——兼论中国景观史研究的一个方法问题>，*《清华大学学报（哲学社会科学版）》*，3（2023），页 140-156 / Jingping Zhang, 'From 'Borderlands' to 'Upstream': The Evolution of the Modern Lanzhou Yellow River Landscape Theme', *Journal of Tsinghua University (Philosophy and Social Sciences)*, 3 (2023), pp. 140-156.

principles while addressing local specifics—enhances relevance.

Chinese scholars have applied Hoskins' historical methods to study historic cities but criticized his overemphasis on Western contexts and neglect of traditional Chinese landscape connotations, highlighting limitations in Chinese settings. Over time, while Hoskins' research provides a foundational framework, his original concepts of landscape formation require comprehensive reassessment in cross-cultural contexts, with adjustments and expansions to offer suitable models for new research.

In conclusion, Hoskins' 'landscape as historical text' and 'historical layering' theories have revolutionized landscape history research. Through cases like England's manorial economy and Industrial Revolution-era rural transformations, he revealed how landscapes gradually evolved into their current forms, offering key insights for understanding indigenous landscape formation in China. However, his emphasis on 'gradual continuity' inadequately addresses Chinese landscapes' 'rupture and reconstruction" characteristics—such as the Xianfeng (1851-1861) and Tongzhi (1862-1874) period's embankment system shift. Additionally, Hoskins' 'field archaeology + local archives' evidential chain, rooted in Europe's medieval documentary completeness, faces deep differences in Chinese source types, generation logic, and cultural implications.

Notably, this study's extensive temporal scope encounters challenge due to the scarcity of written/visual records from the Pre-Qin period, where only subjective myths, legends, and poems survive. Fortunately, recent archaeological advancements in the Jianghan Plain have made excavation reports primary data sources for Pre-Qin landscape studies.

Over the past three decades, Jianghan Plain archaeological research has covered the

Late Palaeolithic to early Qin periods, with notable findings from the Late Neolithic (e.g., Qujialing, Shijiahe Cultures) and Xia-Shang-Zhou periods (e.g., Panlongcheng Site). Works like Prehistoric Settlement Sites in Hubei compile 19 archaeological reports on settlements such as Shijiahe, providing rich data on original and present conditions. [32] Fang's analysis of Shijiahe's water management system and rice paddies reveals advanced prehistoric civilization. [33] Meng's surveys around Shijiahe expand understanding of settlement development. [34] Wu uses plant flotation to confirm Neolithic rice agriculture. [35] Khan's discovery of diverse edible plant remains at Qujialing demonstrates prehistoric dietary diversity. Wu's environmental archaeology study of Tanjialing investigates Neolithic decline factors. [36] Dou explores Shang period human-environment interactions via interdisciplinary methods. [37] Yang's documentation of Hubei archaeological findings connects the region's landscape development trajectory from prehistory to modernity, providing essential baseline data. [38]

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[32] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015）. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015)

[33] 方勤, 赵阳, 李瑞, 王琢玺, 钟倩, 朱世乾, 昝存宝, 李晓杨, 杨宇阳，〈天门石家河城址及水利系统的考古收获〉，*《江汉考古》*，（01）2023，页 19-35 / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system', *Jianghan Archaeology*, (01) 2023, pp. 19-35.

[34] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，〈石家河遗址群调查报告〉，*《南方民族考古》*，（00）1993，页 213-294 / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.

[35] 吴传仁, 刘辉, 赵志军, 〈从孝感叶家庙遗址浮选结果谈江汉平原史前农业〉，*《南方文物》*，4（2010），页 65-69 / Chuanren Wu, Hui Liu, Zhijun Zhao, 'Discussing Prehistoric Agriculture in the Jianghan Plain Based on the Flotation Results from the Yejia Temple Site in Xiaogan', *Cultural Relics in Southern China*, 4 (2010), pp. 65-69

[36] Muslim Khan, Ling Yao, Yuzhang Yang, Yang Tao, Weiya Li, Dewei Zhang, Yunbing Luo, Juzhong Zhang. 'Plant foods consumed at the Neolithic site of Qujialing (ca.5800-4200 BP) in Jianghan Plian of the middle catchment of Yangtze River', China. *Plant Systematics and Evolution*, 13 (2022).

[37] 豆海峰，*《冲击与调适：长江中游商代文化与社会演进的考古学观察》*，（北京：科学出版社，2021）. / Haifeng Dou, *Impact and Adaptation: An Archaeological Observation of Shang Dynasty Culture and Social Evolution in the Middle Yangtze River Region*, (Beijing: China Science Publishing & Media Ltd., 2021).

[38] 杨宝成，*《湖北考古发现与研究》*，（武汉：武汉大学出版社，1995）. / Baocheng Yang, *Archaeological*

Rowan K. Flad and Chen Bozhen's landscape archaeology synthesis of the Sichuan Basin, Three Gorges, and middle Yangtze River offers cross-regional comparative insights into Jianghan Plain landscape evolution. [39] Zou's analysis of Panlongcheng's water system changes provides a micro-level case study of human-water interactions, while Zhang's research on Shang-Zhou cultures illuminates Bronze Age landscape-shaping forces. [40]

The Jianghan Plain's rich historical content and multi-faceted archaeological research significantly contribute to historical landscape feature studies. In summary, regional archaeological research—focused on ancient civilizations, urban planning, site environments, water systems, and human-environment relationships—provides invaluable objective evidence for studying Pre-Qin landscapes, compensating for the lack of written records.

Methodology and Methods

Methodological background

In the early 19th century, the term 'landscape' was initially introduced into geographic studies by the German geographer and botanist Alexander von Humboldt. [41] From the

Discoveries and Research in Hubei Province, (Wuhan: Wuhan University Press, 1995).

[39] Rowan K. Flad, 陈伯桢, *《古代中国内陆》*,（北京：北京联合出版公司，2021）. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021).

[40] Hongbo Zheng, 'Birth of the Yangtze River: age and tectonic-geomorphic implications', *National Science Review*, 2 (2015), pp. 438–453.

[41] Naveh, Zev, and Lieberman, Arthur S, *Landscape ecology: theory and application*, (New York: Springer Science

late 19th to the early 20th century, with the advancement of human geography, the concept of landscape underwent systematic elucidation and widespread application within the field of geography, emerging as a central theme and core focus of human geographic research.

In contrast to its usage in geography, the concept of landscape in sociology and anthropology tends to be more anthropocentric. In the early 20th century, American geographer Carl Sauer distinguished cultural landscapes from natural landscapes, highlighting the role of human cultural practices in the concept of landscape. [42] David posits that wherever humans are present, there is a landscape, asserting that landscapes are integral to the formation of social relationships within human societies. Every human society, whether historical or contemporary, possesses its own distinct landscape structure. [43]

In the 1960s, human geography began to theoretically influence landscape archaeology, shifting early archaeological studies of landscapes to focus more on human-environment relationships. From the perspective of human geography, the primary emphasis in archaeological landscape studies is on the interaction between human activities and the composition and changes in landscapes within a region. These studies often employ regional surveys, literature reviews, cartographic mapping, and selective test excavations to uncover the phased processes of landscape evolution. [44] However, landscapes are both a regional and an integrative concept. Landscape archaeology

& Business Media, 2013), p. 356.

[42] Carl, Sauer, *The morphology of landscape*, (Berkeley: University of California Publications in Geography, 1925), pp. 19-53.

[43] David Carmichael, *Sacred sites, sacred places*, (London: Routledge, 2013), pp. 18-19.

[44] Michael Aston, and Rowley Trevor, *Landscape archaeology: an introduction to fieldwork techniques on post-Roman landscapes*, (Newton Abbot: David & Charles, 1974).

encompasses the comprehensive characteristics of geography, ecology, resources, society, economy, and culture within a region, systematically integrating these aspects to provide a holistic understanding of the phased historical development of a specific area.

In the mid-20th century, scholars in Western countries began to investigate the development processes of landscapes across various historical periods, resulting in numerous publications such as Rackham's *The History of the Countryside* and Hoskins's *The Making of the English Landscape*. Rackham asserts that researchers of historical landscapes should not confine their analysis to written records alone; instead, they should engage directly with the land to observe and reflect upon the tangible elements and their underlying significance. His work highlights the use of diverse research methods, including archaeological data, aerial photographs, plant studies, and textual records. Similarly, Hoskins argues that a comprehensive depiction of landscape history requires more than just literary sources. Fieldwork can reveal new insights about landscape elements not covered in written documentation.

In the book *The Making of the English Landscape*, Hoskins outlines the historical evolution of the English landscape over the past 5,000 years. He notes that human activities have profoundly influenced this land, resulting in the diverse landscapes of the nation as they appear today. [45] Thus, the study of landscape history should involve an exploration of both natural and human landscapes to understand the development of human societies. [46] Hoskins also emphasizes the importance of archaeology in understanding local history, settlement patterns, topography, and abandoned medieval

[45] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), p. 1.

[46] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), p. 16.

village sites. [47] He argues that studying landscape history requires not only a grasp of historical knowledge but also the ability to pose sociological questions and have a basic understanding of natural geography, geology, climate, botany, medicine, and architecture. [48] According to Hoskins, to elucidate the underlying logic behind the continual changes in the English landscape, one must consider historical chronology.

Based on the understanding, this thesis will employ a chronological approach to elucidate the composition and characteristics of surface landscapes across different historical periods. This method will be grounded in the analysis of the current landscape state within the study area, with the aim of uncovering clues about the historical evolution of the landscape. Historical documents (such as archaeological excavation reports, county records, historical archives, poetry, historical books and historical maps) will be reviewed to understand the changes in land and population over time, as well as other relevant information affecting human-environment relationships. Field investigations will be conducted to identify traces of human activities on the surface. Integrating methods from landscape archaeology and utilizing Geographic Information System (GIS) tools will facilitate the exploration of relationships between past human activities and landscape evolution, linking the complexity of human activities and archaeological findings with the spatial heterogeneity of landscapes. High-temporal-resolution, high-resolution, and hyperspectral remote sensing imagery will play a crucial role in supporting these analyses. While a multidisciplinary approach is essential for comprehensive studies across China, such an endeavour would require significant resources, exceeding the scope of a doctoral research project, so this study will focus on the Jianghan Plain as a case study. This focused scope allows for targeted application of the research methods, facilitating testing and refinement during the project

[47] John Beckett, 'Writing local history', *Writing local history*, (Manchester: Manchester University Press, 2007), p. 108.

[48] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014), p. 17.

implementation phase, and enabling broader application following the exploratory stage.

Research methods

A long-term examination of historical landscapes in China holds significant implications for research in this field. By investigating landscape changes over several centuries or even millennia, one can analyse long-term trends and gradual evolutionary processes. This method of extended temporal analysis enables the identification of deeper patterns and underlying logics within landscape evolution, thereby avoiding the potential biases that may arise from a solely short-term perspective. Given China's extensive historical narrative, many historical landscapes have undergone protracted processes of formation and transformation, necessitating a long-term approach to examine their sustained developmental trends and evolution patterns. Conducting cross-temporal comparative analyses allows for the juxtaposition of landscape characteristics and human activities across different historical periods, thereby enhancing our understanding of landscape development and change. Such comparative studies can reveal both continuity and discontinuity in landscape evolution, as well as the enduring impacts of human activities on these landscapes.

Field research is also important. The author conducted field observations of the landscape in the Jianghan Plain. This involved examining existing landscape features, geographic environment and cultural relics, and documenting characteristics related to the form, structure and components of the landscape. Specific details such as plant species, topography and architectural styles were recorded. Methods such as photography and sketching were employed to capture the current state of the landscape, thereby providing tangible data for subsequent analysis. This direct observation and experience offer valuable impressions and primary data for the research, potentially

revealing details and phenomena that may be overlooked in literature and data.

A substantial body of literature will be utilized. By examining relevant historical documents, geographical materials, and academic research papers, one can gain insights into and compare the historical background, development processes and current research status of landscapes. Literature research provides a more comprehensive and in-depth understanding, offering theoretical support for comparative analysis. Ancient historical texts, local gazetteers, travelogues, and poetry may contain descriptions and records of local geographical environments, natural landscapes and cultural landscapes, which are crucial for studying the history of landscape development. For instance, ancient texts can provide information on the distribution of lakes, changes in water systems and urban construction in the Jianghan Plain across different dynasties. Reviewing excavation reports from the Jianghan Plain region, such as studies of ancient sites, tombs and buildings, can offer insights into the lifestyles, production activities and social organizations of different historical periods. By analysing the layout of sites, architectural structures, and unearthed artifacts, one can understand settlement patterns, living environments and agricultural practices of the time, thus revealing the evolutionary processes of various landscapes.

Topographic and geomorphological analysis can also be useful. Utilizing contemporary geographic information technologies, such as Remote Sensing (RS) and Geographic Information Systems (GIS), for the surveying and analysis of natural landscapes such as the topography and landforms of the Jianghan Plain. GIS technology enables the visualization of landscape data, facilitating more intuitive analysis. For instance, by examining the formation processes of the plain and its topographical variations, it is possible to assess the impact of these natural geographic elements on the development of cultural landscapes. GIS can also aid in obtaining information related to changes in lakes, river course alterations, and other aspects related to water system distribution.

It is essential to draw on the theories and methodologies of other disciplines, such as archaeology, ecology, and sociology. Discoveries in archaeology can furnish tangible evidence of ancient landscapes, while ecological insights facilitate an understanding of the ecosystems and biodiversity present within these landscapes. Sociological research can elucidate the ways in which human social organization and cultural traditions influence landscapes. Through a multidisciplinary approach, a comprehensive analysis and interpretation of landscapes can be achieved from diverse perspectives.

Time and space

The objective of historical landscape studies is to reconstruct the characteristics of landscapes from specific historical periods while exploring their evolutionary processes, causes, and underlying patterns. Consequently, it is essential to first restore the appearance of landscapes from particular historical periods, and then compare the features of landscapes across different historical stages to identify changes over time. To examine the historical landscape of the Jianghan Plain, it is necessary to consider both horizontal geographical comparisons and vertical temporal connections.

Geographically, the Jianghan Plain is part of China, and its development over thousands of years has been intricately linked to the broader context of China. In other words, there has been a continuous interplay and interaction between the Jianghan Plain and China as a whole. At times, broader factors have constrained the local landscape, while at other times, local conditions have influenced the broader context. Therefore, when studying the historical landscape of the Jianghan Plain during a specific period, it is crucial to examine historical conditions across China, particularly the historical backgrounds of adjacent regions, to avoid isolating the historical study of the Jianghan

Plain.

Within the temporal dimension of history, although utilizing traditional historical chronologies to analyse the continuity of Chinese dynasties provides deep insights, it also presents evident challenges in practice. Dr H.C. Darby, a British historical geographer, notes that various elements within the geographical landscape undergo changes that do not occur simultaneously or at the same rate. He also points out that some landscape elements need to be referenced multiple times across continuous historical periods, making repetition unavoidable. [49] While these challenges may be addressed, finding appropriate solutions remains difficult. Consequently, viewing landscapes as temporal layers, where characteristics from different historical periods overlap, implies that observing contemporary landscapes reveals traces from multiple historical periods simultaneously, so for the study of historical landscapes, determining the appropriate historical time density for the research area and defining each historical time node are particularly crucial.

It is crucial to describe the evolving landscape of the Jianghan Plain according to the chronological sequence of Chinese history to understand the underlying logical relationships. Relying solely on the historical definition of dynastic divisions to study the landscape history of the Jianghan Plain may prove to be inadequate. It is essential, therefore, to reclassify the landscape based on the temporal changes of the landscape factors within this framework. Hoskins' approach in *The Making of the English Landscape*, which utilizes long-term studies to elucidate the development of the English landscape, provides significant insight for this paper. His concept of long-term timeframes and the underlying methodological approach highlight the need to focus on landscape elements that influence the present landscape, with the historical periods in

[49] Henry Clifford Darby, 'On the relations of geography and history', *Transactions and Papers (Institute of British Geographers),* 19 (1953), pp. 1-11.

which these elements emerged serving as a basis for dividing historical eras in the study area. It is important to emphasize that the study of historical landscapes through long-term perspectives should focus on the interactions between humans and nature. Here, 'nature' is defined as the environment surrounding human life, corresponding to human society.

In summary, this thesis will categorize the historical evolution of the Jianghan Plain into seven distinct periods based on objective historical changes. These periods are as follows: 1. the Palaeolithic Age; 2. the Neolithic Age; 3. the Bronze Age; 4. the period from the Qin to the Yuan Dynasties; 5. the period from the Ming to the Qing Dynasties; 6. the modern period, specifically from 1840 to 1949; and 7. the contemporary period, from 1949 to the present day. This classification allows for an extended time frame for each historical period, facilitating the use of data and the examination of landscape changes.

Other factors

The landscape has long served as a medium for human activities, characterized by continuity and accumulation. [50] Changes in the environment can alter the existing landscape structure and impact shifts in social structures. Conversely, societal changes can transform social organizations and regional cultures, thereby influencing landscape development. [51] The underlying causes of landscape changes are likely the result of interactions between humans and their environment. To reconstruct the landscape of the Jianghan Plain across different historical periods and to create a more detailed depiction

[50] Jeannie Sim, *Report 2: Thematic Study of the Cultural Landscape of Queensland*, (Brisbane: Queensland University of Technology, 2001), p. vi.

[51] 张海，<景观考古学-理论、方法与实践>，*《南方文物》*，4（2010），页 8-17./ Hai Zhang, Landscape Archaeology: Theory, Method and Practice, *Journal of Cultural Relics in Southern China*, 4 (2010), 8-17, (p. 11).

of its evolution, it is useful to immerse oneself in the past. This involves assuming the perspective of that era to uncover how details affecting landscape development were gradually introduced and when they occurred. Therefore, to accurately present the formation and evolution of the Jianghan Plain's landscape, this study must consider not only geographical space and historical time but also factors such as population movement, land use patterns, and climate change, in order to enrich the details and clues of the historical landscape.

Throughout Chinese history, instances of population migration have been numerous, leading to changes in the demographics of most residential areas. People from different regions introduced distinct local cultures, resulting in significant variations in the cultural landscapes they created and the environmental impacts of their activities. The integration of diverse cultures laid the groundwork for the emergence of new phenomena, as exemplified by the Jianghan Plain. Analysing the changes in the populations residing in the Jianghan Plain during historical periods and the cultural landscapes they produced is evidently significant for understanding the influence of historical landscapes on human activities. This represents a practical research approach, with a particular focus on two key factors: population migration and land use patterns. On one hand, changes in land use practices by a single ethnic group often lead to the creation of new cultural landscapes. On the other hand, different ethnic groups modify and transform the original natural landscapes in various ways, creating diverse cultural landscapes through their interactions with the natural environment in their living areas.

In addition, while climate change historically has occurred largely independent of human activities, it remains a significant natural factor exerting profound impacts on human societies. [52] Alterations in climatic resources inevitably lead to changes in land

[52] 王铮，张丕远，周清波，<历史气候变化对中国社会发展的影响》，*《地理学报》*,4(1996),页 329-338./ Zheng Wang, Piyuan Zhang, Qingbo Zhou, 'The Impacts of Climate on the Society of China During Historical Times',

resources and consequently influence shifts in land use patterns. Thus, utilizing natural climate change as a guiding framework to explore how humans adjust their spatial activities and land use in response to environmental changes offers a valuable approach for examining various cultural landscape transformations within a region. Specifically, for the Jianghan Plain, natural climate variations have significantly influenced the formation and development of certain elements within its historical landscapes. Analysing the formation and development patterns of historical landscapes in the Jianghan Plain through the lens of climate change provides a meaningful contribution to the overall research.

In summary, this study will employ a chronological approach to reveal the composition and characteristics of surface landscapes across different historical periods. The research will be grounded in the current state of the landscape within the study area, aiming to uncover clues about the historical evolution of the landscape. Field investigations will be conducted to document the current landscape through methods such as photography and sketching, capturing specific details including plant species, topography and architectural styles. Historical documents will be reviewed to understand the changes in land use and population over time, as well as other factors influencing human-environment relationships. Modern literature will provide supplementary information to give insights into human production activities, settlement patterns, living environments and agricultural practices across different historical periods, allowing for the inference of unique landscape features in those times. GIS tools will be employed to analyse the relationship between past human activities and landscape changes, linking the complexity of human actions and archaeological findings with the spatial heterogeneity of the landscape. High-temporal, high-resolution, and hyperspectral remote sensing imagery will be analysed to aid in accurate assessments. Finally, the study will summarize and compare the collected data and

Acta Geographica Sinica, 4 (1996), 329-338.

information to investigate the causes of different landscape variations. This includes analysing factors such as natural conditions, historical culture, and socio-economic influences on landscape formation and development. Specifically, the study will address why the cultural landscapes of the same region have differed across various historical events, examining whether these differences are due to climate, resource availability, or cultural traditions. The analysis will consider the ecological benefits of natural landscapes (including topography, water resources) and the social benefits of human-made landscapes (including population migration, economic development), exploring the significance of landscapes for human life and natural ecology.

From the perspective of research outcomes, summarizing and comparing the research process and results allows for the identification of characteristics, differences, and commonalities across various periods of landscapes. This synthesis can serve as a reference for future landscape studies and practices. Additionally, the findings from this research can guide landscape management and conservation efforts. Management strategies and protective measures should be tailored to the specific characteristics and needs of different landscapes. For natural landscapes with high ecological value, protection efforts should be intensified, limiting human activity interference. For landscapes with historical and cultural significance, appropriate restoration and conservation should be carried out to preserve cultural heritage. It is important to note that interdisciplinary and comprehensive landscape research is crucial for the entire country of China; however, this requires substantial resources, far exceeding the scope of a doctoral research project so this paper will focus on the Jianghan Plain as a case study. This localized scope allows for targeted application of the aforementioned research methods, facilitating testing and refinement during the project implementation phase, thereby enabling broader application following the exploratory phase.

Research Aims, Objectives, and Questions

Aims

This thesis aims to explore the patterns of agricultural systems in China by integrating field investigations with historical plans and records. Grounded in the methodology defined by Hoskins in his seminal work, *The Making of the English Landscape*, this research employs a variety of landscape study methods to systematically analyse the development of Chinese landscapes from ancient times to the modern era, thereby enhancing our understanding of the nuanced relationship between humans and land. Through an in-depth examination of the natural and historical context of the Jianghan Plain, this study investigates the patterns of agricultural systems. Following a comprehensive literature review, detailed field surveys, and interdisciplinary research, this work reveals the unique characteristics, evolutionary patterns, and profound impacts of the Jianghan Plain across different historical periods on ecology, economy, and culture. Furthermore, it elucidates how this landscape was 'created', thereby providing essential practical foundations and theoretical support for future research into landscape formation in other regions of China.

Objectives

1. To delineate the historical trajectory of landscape development in the Jianghan Plain, revealing the patterns and characteristics of landscape evolution across different historical periods, and identifying newly emergent landscape elements in each era.

2. To investigate the roles of natural factors and human activities in the landscape development of the Jianghan Plain, thereby enhancing the understanding of the interplay between humanity and nature.

3. To assess the effectiveness of the research methodologies employed in the study of the landscape history of the Jianghan Plain, providing methodological insights for similar landscape historical research in other regions.

4. To elucidate the specific impacts of landscape development in the Jianghan Plain on the ecological environment, socio-economic conditions, and cultural heritage, thereby fostering a greater appreciation and understanding of local public heritage, and to propose strategic recommendations for the conservation and utilization of landscape resources in the Jianghan Plain, promoting the sustainable development of the region.

Research Questions

1. What are the landscape characteristics of the Jianghan Plain during different historical periods?

2. How have natural factors and human activities collaboratively shaped these landscape characteristics?

3. In what ways can research methodologies be effectively integrated in the study of the landscape development history of the Jianghan Plain?

4. What impacts does the landscape development of the Jianghan Plain have on the ecological environment and cultural heritage?

Thesis structure

The thesis is organized into nine chapters, which collectively illustrate the formation and evolution of the regional landscape of the Jianghan Plain from the Palaeolithic Age to the present.

Chapter One serves as an introduction, while Chapter Nine provides a comprehensive summary of the entire text. Chapters Two through Eight constitute the core sections of the thesis, with Chapter Nine offering a systematic conclusion.

Chapter Two examines the earliest landscape of the Jianghan Plain, focusing on the natural environment altered by physical processes and the modifications introduced by human activities. During the late Palaeolithic Age, the ancestors of the Jigongshan site arrived in the Jianghan Plain, leaving evidence of their habitation. At this time, the Jianghan Plain was predominantly in a pristine natural state.

Chapter Three explores the initial formation of the Jianghan Plain landscape during the Neolithic period. The early inhabitants began cultivating rice and establishing settlements, which gradually developed into natural villages. The rise of the Shijiahe culture marked the emergence of urbanization. This phase can be regarded as the preliminary formation of the Jianghan Plain landscape.

Chapter Four discusses the evolution of the Jianghan Plain landscape during the Bronze Age. In this historical period, in addition to the indigenous Sanmiao people （三苗人）, groups from the Central Plains settled in the Jianghan Plain. The integration of Central Plains culture with local traditions led to the emergence of distinctive palace-style architecture and royal gardens, presenting a unique Jianghan Plain landscape within the historical context.

Chapter Five addresses the evolution of the landscape from the Qin Dynasty to the Yuan Dynasty. Due to incomplete historical records and limited archaeological data, this period's description may lack detail. Over approximately 1,500 years, human ingenuity in interacting with nature led to the gradual construction of distinctive water conservancy projects in the Jianghan Plain, which formed a characteristic rural landscape pattern. Buddhist culture influenced the landscape through the construction of Buddhist pagodas, some of which have been preserved through generations. This

chapter also focuses on the spatial distribution and characteristics of rural settlements and the Buddhist pagoda landscape originating from the Wei-Jin and Northern and Southern Dynasties.

Chapter Six explores the evolution of the Jianghan Plain landscape during the Ming and Qing Dynasties. By this period, human production techniques had advanced, transitioning from adapting to nature to actively modifying it, making human activities a significant factor in environmental change.

Chapter Seven examines the evolution of the landscape in modern China. Between 1840 and 1949, Western commercial and industrial influences gradually introduced new forces into China. This era saw the emergence of large industrial buildings, docks, and Western-style architecture as new elements in the Jianghan Plain's landscape.

Chapter Eight investigates the contemporary landscape changes in the Jianghan Plain from the founding of the People's Republic of China in 1949 to the present. During this period, the landscape of the Jianghan Plain has undergone significant changes and updates, reflecting profound transformations and diverse characteristics at both rural and urban levels, showcasing continuous progress and development.

Sources

During the initial Palaeolithic and Neolithic periods, archaeological reports were sought from relevant researchers due to the absence of written records. The reliance on these reports was significant for understanding these eras. Moving into the Bronze Age, the Jianghan Plain experienced considerable cultural prosperity, and extensive

archaeological and cultural research materials were available. Consequently, some archaeological data were derived from specialized centres dedicated to Chu culture research, while other information came from ancient texts.

From the Qin and Han dynasties through to the Yuan period, there are relatively few archaeological reports for this region. This scarcity can be attributed to two primary factors: the possible neglect of the area's development by the rulers of these periods, and the possibility that many artifacts remain undiscovered. The majority of data from this era comes from ancient texts, supplemented by field surveys. In the Ming and Qing dynasties, the closer proximity to the present day has resulted in a relatively high preservation of relics and a well-maintained corpus of written records.

The temporal scope of this study spans approximately 10,000 years, from the Upper Palaeolithic period to the present, covering a significant historical span. To investigate the landscape development history of the Jianghan Plain, this research employs both literature review and field survey methodologies. The literature review includes sources such as archaeological reports, ancient texts, maps, archives and local gazetteers. Field surveys were conducted at archaeological excavation sites, nature reserves and historical villages.

Although the pre-Qin period is distant from the present era, the achievements in archaeological excavations and research on the history of Chu are substantial. In contrast, from the Qin and Han dynasties through the Sui, Tang, Five Dynasties, and Song and Yuan periods, the available data concerning the Jianghan Plain are relatively scarce. By the Ming and Qing dynasties, as well as in modern times, the volume of research and available materials has significantly increased. Consequently, there exists an imbalance characterized by a rich accumulation of sources at both ends of the

historical timeline, with a relative paucity of information in the intermediate periods.

Archaeological report

Archaeological reports are primarily categorized into two types: monographic and journal-style reports. The former includes reports published by specialized publishers such as the Cultural Relics Publishing House and the Science and Technology Publishing House, which can be directly purchased from the official websites of these publishers. Given that some of these monographic reports have been issued for a considerable time and are no longer available for purchase, these reports are obtained by the author from the National Library of China and subsequently photocopied. Reports such as *Archaeological Discoveries at Jinnan City*, The *Panlongcheng Site - Report of Archaeological Excavation from 1963-1994*, and *Longwan of Qianjiang Excavation Report of the Longwan Site 1987-2001* have been provided by researchers from the Hubei Provincial Institute of Cultural Relics and Archaeology. Journal-style archaeological reports are primarily sourced from the China National Knowledge Infrastructure (CNKI), with a small portion obtained from the collections of the National Library of China and another portion from the Hubei Provincial Institute of Cultural Relics and Archaeology.

Ancient texts

To examine the historical development of the Jianghan Plain, each standard historical text from the *Twenty-Four Histories (《二十四史》)* is utilized to analyse the political and cultural contexts of the Jianghan Plain during various historical periods. For instance, *The History of the Song Dynasty (《宋史》)* corresponds to the Song Dynasty,

while *The History of the Yuan Dynasty (《元史》)* pertains to the Yuan Dynasty. These ancient texts are primarily sourced from the Chinese Ancient Books Database - Digital Ancient Books.

Ancient Chinese texts related to geography, such as the *Commentary on the Waterways Classic* *(《水经注》)*, *Yuanhe County Maps and Records (《元和郡县图志》)*, and *Taiping Huanyu Ji* *(《太平寰宇记》)*, are instrumental in exploring the geographical features and changes within the Jianghan Plain region across various historical periods. Similarly, ancient agricultural texts, including *Xia Xiao Zheng (《夏小正》),* and *Agricultural Book by Wang Zhen (《王祯农书》)*, are valuable for investigating the characteristics of the fields. Additionally, collections of poetry, such as the *Song of Chu (《楚辞》),* and *the Book of Songs (《诗经》)*, provide insight into the social conditions of different historical eras. The original texts are primarily obtained from the digital facsimiles in the Chinese Ancient Texts Resource Database.

Maps

This study utilizes volumes 1 to 8 of *The Historical Atlas of China* edited by Qixiang Tan, to gather data on the boundaries, hydrology, and topography of the Jianghan Plain region across various historical periods. Information on the distribution of cultural relics in the Jianghan Plain over different eras is extracted from the *An Atlas of Chinese Cultural Relics: Hubei Volume*, edited by the National Cultural Heritage Administration of China. Regional maps are sourced from local chronicles of various periods and locations, with some obtained from archives and the Rare Books Department of the National Library of China, and others accessed through the online resources of the Hubei Local Chronicles Digital Library. The *Investigation of Jianghan Embankment Map (《江汉提防图考》)* depicts the rivers, ditches, towns, administrative regions, and

water conservancy projects within Hubei Province during the Qing Dynasty. This map set was acquired from the National Digital Library of China.

Additionally, several historical maps published from the 17th to the early 20th century provide detailed depictions, such as 'the General Map of Streets Inside and Outside the City of Hubei Province' (湖北省城内外街道总图), and 'the Map of Chu River during the Wanli Period' (万里楚江图). These maps are primarily sourced from two platforms: 1. obtained through queries and downloads from the Old Map Online website; 2. acquired via searches and downloads from the Chinese Ancient Documents website.

The Annals of Hubei Province

The Annals of Hubei Province provides a comprehensive and systematic account of the natural, economic, political, cultural, and social history and current status of the administrative region of Hubei Province. This collection of documents is instrumental in defining the scope of the Jianghan Plain and understanding its natural geographic and socio-cultural background as recorded officially. The compilation consists of 42 volumes. This thesis primarily references Volume 2 (General Overview of Nature and Geography), Volume 3 (Meteorology and Environmental Protection), Volume 4 (Land Resources and Natural Disasters), Volume 7 (Agriculture and Grain Production, Part I), Volume 9 (Water Conservancy and Forestry), and Volume 13 (Urban and Rural Construction and the Three Gorges Project). *The Annals of Hubei Province* was obtained from the Department of Culture and Tourism of Hubei Province.

Additional scholarly literature

Additional published materials relevant to this study include academic works and

papers from both Western and Eastern sources, as well as illustrations and manuscripts. The primary sources of these materials are: the University of Sheffield Library, the National Library of China, the Hubei Provincial Library, and the China National Knowledge Infrastructure (CNKI).

Archives

To gather comprehensive data to support the study of the landscape history of the Jianghan Plain, this research selected nine archives located within the Jianghan Plain region: the Hubei Provincial Archives, the Archives of Xianning City, the Archives of Jingmen City, the Archives of Jingzhou City, the Archives of Tianmen City, the Archives of Shishou City, the Archives of Qianjiang City, the Archives of Xiaogan City, and the Archives of Jiayu County. However, after a thorough examination of records at each archive, it was found that, with the exception of the Hubei Provincial Archives, the other archives contained very limited documents related to changes in the landscape. Therefore this study exclusively utilized the data collected from the Hubei Provincial Archives. This data primarily includes planimetric maps of field systems and levee diagrams from various villages within the Jianghan Plain region during the 1930s and 1940s. These maps are instrumental in providing a visual understanding of the field patterns and landscape features of that period.

Aerial imagery

Although some landscapes have been destroyed by intensive modern agriculture, traces of past features can still be identified from aerial views. Utilizing aerial imagery can aid in tracing and analysing landscape elements, and comparing the same land across

different periods can provide a clearer understanding of the changes that have occurred over time.

This thesis uses two types of aerial imagery: contemporary aerial photographs and archival aerial photographs from the recent modern period. The first type includes: 1. Aerial photographs captured by the author using a drone during field surveys to obtain primary data; 2. Aerial imagery sourced from archaeological reports. The second type of archival aerial photographs is obtained through: 1. Queries and purchases from the 'National Collection of Aerial Photography' website; 2. Searches and downloads from the 'Historical Photograph of China' website.

Field investigation

In 2021, 2022, and 2023, the author conducted six field surveys in various locations within the Jianghan Plain region. The four surveys undertaken in 2021 and 2022 primarily focused on archaeological sites and the surrounding villages and towns. The objective was to assess the current state of the landscape around these sites and to investigate human modifications to the natural environment. Although some archaeological reports provide descriptions of the sites and their surrounding lands, accompanied by a limited number of photographs, these reports do not emphasize the landscape itself. Therefore, to obtain firsthand data, the author employed the following methods: 1. Aerial and video recordings using drones and cameras; 2. Hand-drawn sketches; 3. Measurement records.

In the initial four field investigations, the author visited various archaeological sites including the Shijiahe site, the Qujialing site, the Zoumaling site, the Yejiamiao site, the Panlongcheng site, the Longwan site, and the Zhangxiwan site, as well as the

villages and towns associated with each of these sites.

Since the construction of large-scale hydraulic projects often results in changes to river courses and lakes, thereby impacting human communities, the author, during the fifth field investigation, examined the lifestyles, village characteristics and rural landscapes of the surrounding areas along the Jingjiang Grand Embankment—a significant hydraulic project that began construction during the Eastern Jin Dynasty.

In the sixth field investigation, the author visited Paizhouwan Town in Jiayu County to observe the condition of the local paddy fields and assess the impact of embankments on the local landscape and residents. Additionally, the author travelled to the Hanyang Iron Works and Wuhan Yangtze River Beach, focusing on the industrial landscape of the modern Jianghan Plain and the concessions that have incorporated Western cultural elements.

The primary data collected by the author during the field investigation includes photographs, videos, hand-drawn sketches, measurement data, and research plans.

Chapter 2. Original Landscapes: The Primordial Landscape of Human Origins

Introduction

Approximately 65 million years ago, during the Palaeocene epoch, a collision between the Indian Plate and the Eurasian Plate triggered the uplift of the Tibetan Plateau. [53] This neotectonics event caused the elevation of various plateaus, including the Inner Mongolian Plateau, the Loess Plateau and the Yunnan-Guizhou Plateau, establishing the fundamental three-step topographic structure of China (Figure 1). Moving eastward from the Tibetan Plateau, the topography generally exhibits a descending staircase pattern, gradually sloping from high elevations in the west to lower elevations towards the sea. [54] This pronounced elevation gradient, resulting from the uplift of the plateau, has had significant impacts on the climate, ecological environment and river systems. The topographic model directly influences the macrostructure of the central water systems, as the meltwater from the Himalayas feeds the Yangtze and Yellow Rivers, which originate in this region and flow eastward to the sea.[55] The extensive lands of ancient China, irrigated by the rich water systems of the Yangtze and Yellow Rivers, were thus well-prepared for the emergence of human civilization.

Given that the primary objective of this thesis is to examine the various changes in the natural environment of the Jianghan Plain caused by human subjectivity and agency, it

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[53] Xiaodian Jiang, and Xiangli Zheng. 'Seismic reflection data support episodic and simultaneous growth of the Tibetan Plateau since 25 Myr.', *Nature communications,* 5 (2014).

[54] 尤联天，杨景春，*《中国地貌》*，（北京：科学出版社，2020），页 1-2./ Lianyuan You, Jingchun Yang, *Chinese landform*, (Beijing: China Science Publishing, 2020), pp. 1-2.

[55] Hongbo Zheng, 'Birth of the Yangtze River: age and tectonic-geomorphic implications', *National Science Review*, 2 (2015), pp. 438–453.

is appropriate to begin the analysis with the natural environment.

To gain a clearer understanding of the natural environmental conditions prior to human settlement in the Jianghan Plain, it is essential to examine the original landforms altered by physical processes. This includes investigating factors such as topography, climate, vegetation, fauna and the lakes, whose formation was a protracted process.

As Modified by Physical Processes

Original landforms

The Jianghan Plain is situated within the Jianghan Basin, located in the middle reaches of the Yangtze River, and is part of China's third geomorphological step.[56] The geological structure of the region has predominantly experienced subsidence over time. The Jianghan Basin features a tiered distribution of landforms, progressing from the outermost structures to the centre, including the Central Mountains, low mountains, hills, and alluvial plains (Jianghan Plain) (Figure 6).[57] For the study area, the Jianghan Plain, a Digital Elevation Model (DEM) was created using a 50-metre contour interval, providing a clear elevation simulation map (Figure 4). This map reveals the current geographical structures of the plain, with elevations ranging from 41-50 metres corresponding to elevated areas, 31-40 metres to low elevated areas, and less than 30 metres to flat lands. Among these, the flat land area, with elevations under 30 metres, is the largest, covering more than two-thirds of the region; the low elevated areas come

[56] 余文畴，卢金友，《*长江河道演变与治理*》，（北京：中国水利水电出版社，2005），页 93-101. / Wenchou Yu, Jinyou Lu, *Evolution and Management of the Yangtze River Channel,* (Beijing: China Water & Power Press, 2005), pp. 93-101.

[57] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 346. / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 346.

next, while the elevated areas occupy the smallest portion of the land.

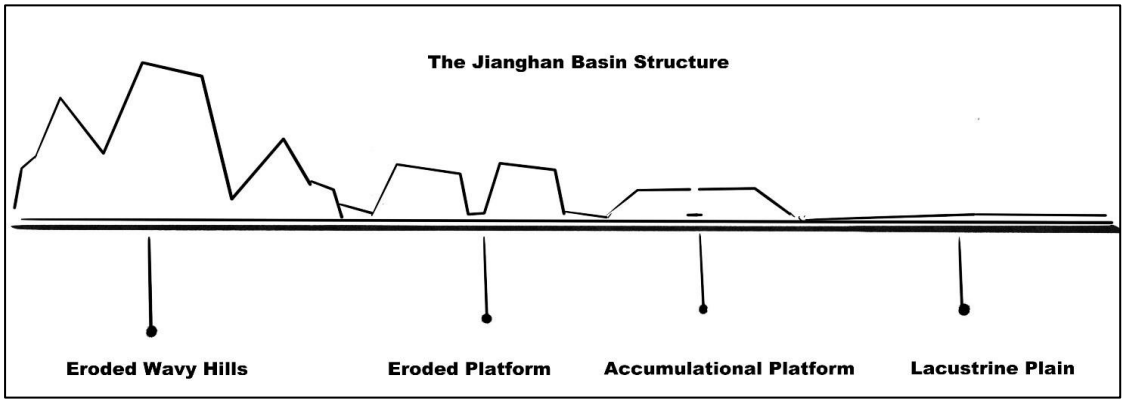


Figure 6. the Jianghan Basin Structure (Source: created by the author)

The Jianghan Plain developed within the Jianghan Basin, exhibiting a stratified and stepped distribution. Under the influence of tectonic activity, the entire basin not only underwent continuous subsidence but also accumulated substantial sediment transported by the Yangtze River and its tributaries. This process gradually led to the formation of the Lianghu Plain, characterized by numerous lake systems.[58] During this

[58] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 347 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 347.

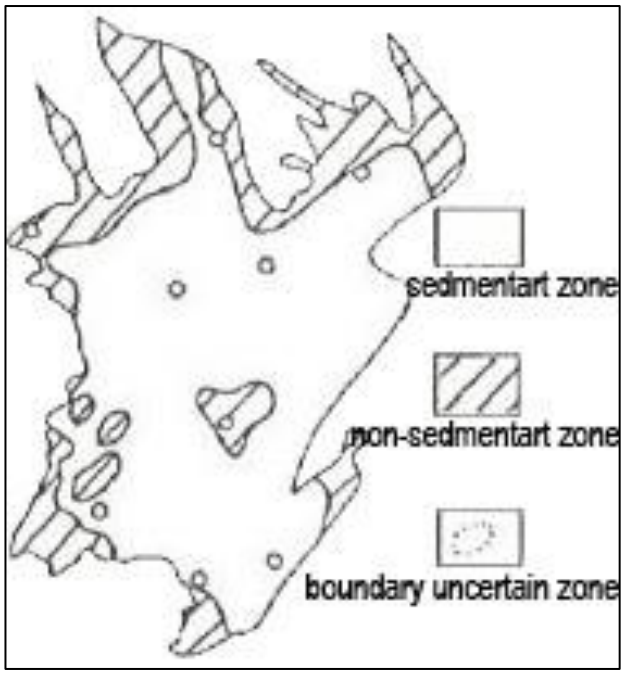


Figure 7. Schematic Diagram of Quaternary Deposition Distribution in the Jianghan Plain (Source: 徐杰,邓起东,张玉岫,殷秀华,虢顺民,牛娈芳,'江汉-洞庭盆地构造特征和地震活动的初步分析',*地震地质*,4(1991),页 332-342 / Jie Xu, Xiu Wang, Xiuhua Yin, Shunmin Guo, Luanfan Niu, Structural Features and Seismicity in Jianghan-Dongting Lake Basin', Seismology and Geology, 4 (1991), pp. 332-342.)

period, most of the plain remained submerged until the early Quaternary, when regional uplift led to a gradual expansion of the sedimentary area (Figure 7).[59] The geomorphological changes transformed the Lianghu Plain into a transitional landscape from hilly terrain to the interior plain. During this epoch, extensive lakes receded and disintegrated, revealing a riverine plain landscape on the plain.[60]

With the onset of the Late Pleistocene glaciation, the water level of the Yangtze River significantly decreased, leading to the substantial shrinkage and eventual desiccation of numerous lakes in the Two Lakes Plain region. Consequently, much of the plain became a network of river valleys, revealing expanses of fertile land.[61] It was during this period that human presence is first recorded in the region. Archaeological evidence confirms the existence of multiple Upper Palaeolithic sites in the Jianghan Plain. However, systematic archaeological excavation has been conducted only at the Jigongshan site, about which

[59] 徐杰,邓起东,张玉岫,殷秀华,虢顺民,牛娈芳,<江汉-洞庭盆地构造特征和地震活动的初步分析>,*《地震地质》*,4(1991),页 332-342 / Jie Xu, Xiu Wang, Xiuhua Yin, Shunmin Guo, Luanfan Niu, Structural Features and Seismicity in Jianghan-Dongting Lake Basin', *Seismology and Geology*, 4 (1991), pp. 332-342.

[60] 刘茂昌，刘武，<第四纪江汉平原湖群的演变>，*《华中师范大学学报（自然科学版）》*，4（2005），页 533-536 / Maochang Liu, Wu Liu, 'The Evolution of Lakes on Jianghan Plain in Quaternary', *Journal of Central China Normal University (Nat. Sci.)*, 4 (2005), pp. 533-536.

[61] 杨达源，<晚更新世冰期最盛时长江中下游地区的古环境>，*《地理学报》*，4（1986），页 302-310 / Dayuan Yang, 'The Paleoenvironment of the Mid-Lower Regions of Changjiang in the Full-Glacial Period of Late Pleistocene', *Acta Geographica Sinica*, 4 (1986), pp. 302-310.

related reports and research findings have been published. Given that the Palaeolithic era is not documented in written records, archaeological reports serve as the primary theoretical support for understanding this period, so this chapter will focus exclusively on the Jigongshan site to explore the environment of early human habitation in the Jianghan Plain region.

Climate under the geographical division of Qinling

Climate change has a profound impact on human civilization, particularly on the origins and development of early civilizations. Changes in climate inevitably alter surface vegetation distribution and the availability of land resources, thereby affecting human food sources. These shifts, in turn, lead to significant transformations in human survival, lifestyle and production methods. Notably, events such as floods or severe droughts can greatly constrain the development and geographical distribution of early civilizations, sometimes resulting in devastating consequences. Therefore investigating the climatic conditions and their variations during the early stages of human civilization is crucial for reconstructing the human living environment of that era and for understanding the evolution of human civilization in relation to its geographic context.

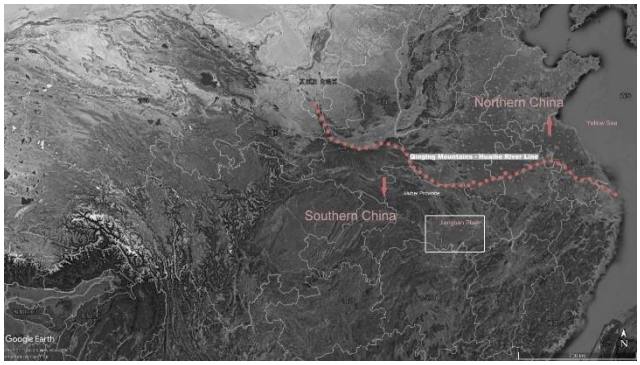


Figure 8. Qingling Mountains (Source: recreated by the author, based on Google Earth)

Between the northern and southern regions of the Chinese mainland lies a mountain range known as the Qinling (Figure 8).[62] Since the Quaternary period, the Qinling has

[62] 藤志宏，王晓红，<秦岭造山带新生代构造隆升与区域环境效应研究>,《陕西地质》，2（1996），页 33-42（第 36 页） / Hongzhi Teng and Xiaohong Wang, 'Studies of the Tectonic Uplift at the Cenozoic Era and the Regionally Environmental Effects in the Qinling Orogenic Belt', *Acta Geology of Shaanxi*, 2 (1996), pp. 33-42 (p. 36).

experienced significant uplift, resulting in the division of the inland plate into northern and southern sections. This mountain range and its extensions stretch from east to west, connecting with the Huai River and forming a vast natural barrier that separates the Yellow River system in the north from the Yangtze River system in the south.[63] Additionally, the Qinling mountains channel the moist southeast monsoon into the Yangtze River basin.[64] Consequently, under the protection of these mountains, the climate in southern China is more humid and stable compared to that in the north. This humid temperate to subtropical climate provides an ideal environment for the development of rice-centred agricultural societies in the Yangtze River basin, making it a hospitable area for ancient human populations.

Since the Quaternary period, the Qinling Mountains, which serve as the natural geographical boundary between southern and northern China, have increasingly demonstrated their role as a natural barrier.[65] This has directly led to alterations in the landscape patterns of China's natural zones. At this time, the Qinling Mountains have reached an elevation of approximately 1500 metres.[66] This elevation constitutes a barrier that impedes the migration of animals across the mountains. On the other hand, it has influenced the atmospheric circulation patterns in northern China, resulting in significant differences in flora and fauna between the southern and northern regions of the country.

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[63] Bruce D. Smith, *'The Emergence of Agriculture'*, (New York: Scientific American Library, 1995).

[64] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 34 / Miao Yu, *'Prehistoric times in the middle reaches of the Yangtze River',* (Wuhan: Wuhan University Press, 2020), p. 34.

[65] 张兰生，方修琦，*《中国古地理》*，（北京：科学出版社，2005），页 237 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 237.

[66] 藤志宏，王晓红，<秦岭造山带新生代构造隆升与区域环境效应研究>, *《陕西地质》*，2（1996），页 33-42（第 36 页） / Hongzhi Teng and Xiaohong Wang, 'Studies of the Tectonic Uplift at the Cenozoic Era and the Regionally Environmental Effects in the Qinling Orogenic Belt', *Acta Geology of Shaanxi*, 2 (1996), pp. 33-42 (p. 36).

The Jianghan Basin, situated south of the Qinling Mountains, is shielded by the surrounding mountains, which prevents the cold and dry winter winds from penetrating the Jianghan Plain within the basin. However, the warm and humid summer air masses tend to remain in the Jianghan Basin for extended periods. This unique geographical structure has led to the development of a humid, precipitation-rich subtropical monsoon climate over the plain. During the Late Pleistocene of the Palaeolithic era, Earth's climate was undergoing significant fluctuations between glacial and interglacial periods.[67] Within this temporal framework, the climate characteristics of the Jianghan Plain exhibited notable dynamic changes and complexity. During the peak of the Last Glacial Maximum, the environment around human populations underwent rapid transformations, leading to the gradual disappearance of familiar food sources and presenting humanity with some of the most severe survival challenges encountered since their emergence. The cold and arid climate conditions had profound effects on the lifestyles of Palaeolithic humans, potentially driving their migration toward warmer and resource-rich regions.

According to the research conducted by Ma and her colleagues, following the end of the Last Glacial Period, China's climate underwent a rapid warming process characterized by fluctuations. During approximately 15.0 ka B.P. and 13.0 ka B.P., the region experienced periods of relative warmth lasting around 1,000 years each. [68] This climatic shift led to a warmer and more humid environment in the Late Palaeolithic Jianghan Plain region, which was conducive to the growth of wild plants and provided more abundant resources for human populations. As a result, the surviving human communities began to engage in agricultural cultivation, animal domestication, housing

[67] 张兰生，方修琦，《*中国古地理*》,（北京：科学出版社，2005），页 108 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 108.

[68] 马春梅，朱诚，郑朝贵，武春林，关勇，赵志平，黄林燕，黄润，<晚冰期以来神农架大九湖泥炭高分辨率气候变化的地球化学记录研究>，*《科学通报》*,S1（2005），页 26-37 / Chunmei Ma, Cheng Zhu, Chaogui Zheng, et al., 'Geochemical Records of Climate Change at High Resolution from the Peat Deposits of Dajiu Lake in Shennongjia Since the Late Glacial Period', *Chinese Science Bulletin*, S1 (2005), pp. 26-37.

construction, settlement establishment and pottery making, eagerly anticipating the arrival of the Neolithic Age.

Vegetation

As described above, it was not until the late Palaeolithic Age that most of the lakes in the Jianghan Plain gradually receded, allowing land to emerge. The warm and relatively stable climate, coupled with abundant water resources and fertile soil, would inevitably foster the growth of wild plants, thereby attracting wildlife. It seems that some humans ventured from their caves at this time, moving from the mountains to settle in the Jianghan Plain.

To elucidate the types of plants present during the Palaeolithic Age, leveraging archaeological research is undoubtedly a highly effective approach. In the early 1990s, Professor Lü documented the results of a systematic reconstruction of plant types in the Jianghan Plain during the Palaeolithic period through palynological analysis in his published research monograph. These findings offer essential insights for inferring the vegetation landscape of the Jianghan Plain during the Palaeolithic era. Lü noted that approximately 10,000 years ago, during the transition from the last glacial period to a warmer phase, temperatures, although rising, remained relatively cool and dry. The vegetation of this period was predominantly composed of coniferous forests, including species such as fir, spruce, and pine, with a small presence of hardwoods like walnut and oak.[69] Shrubs were mainly represented by Rosaceae, although they were less common than trees. Additionally, several herbaceous plants were present, including grasses, buttercups, sagebrush, and sedges.

[69] 闾国年，《*长江中游湖盆扇三角洲的形成与演变及地貌的再现与模拟*》，（北京：测绘出版社，1991），页 113 / Guonian Lü, *Formation, Evolution, and Geomorphological Representation and Simulation of the Lacustrine Fan Delta in the Mid-Reach of the Yangtze River,* (Beijing: Surveying and Mapping Press., 1991), p. 113.

Based on the palynological analysis of the Pleistocene epoch in the Jianghan Plain described in the thesis, it can be reasonably inferred that the vegetation landscape of the Jianghan Plain during this period exhibited a multi-layered forest structure. On one hand, the forest was relatively sparse with monotonous tree species, and the tree canopy was prominent. On the other hand, the herbaceous plants growing on the forest floor, as mentioned in the findings, typically thrived in the lower layers of the forest or in open areas, suggesting the presence of relatively open spaces within the forest. This vegetation landscape likely had a significant impact on human life in the Jianghan Plain during the Palaeolithic era, providing abundant food and resources and influencing their lifestyle and settlement choices.

Ancient fauna

The study of ancient faunas from the Palaeolithic period in the Jianghan Plain is crucial for understanding the primitive ecological environment and the initial adaptation strategies of human settlers in the region. By analysing fossilized remains of animals, we can gain insights into the habitat conditions of Palaeolithic humans from the perspective of animal resources, thereby elucidating the interactions between early humans and their natural environment.

Similarly to wild plants, animal resources are also an indispensable component of natural landscapes and a necessary element for human living environments. Among these, mammals are a significant food resource for humans. Archaeological research has revealed that the mammalian fossils unearthed within Hubei Province are abundant and are often found in association with human fossils (Table 1).[70]

[70] 杨宝成，*《湖北考古研究与发现》*，（武汉：武汉大学出版社，1995），页 3 / Baocheng Yang, *Archaeological*

Sites / Mammal	Jiudaogou	Changyang	Yunxian	Yunxi	Jianshi	Zhangnaodong	Shilongtou
Gigantopithecus					X		
Australopithecus					X		
Macaca			X	X			
Eurasian Beaver			X	X			
Rhizomyidae		X					X
Mus					X		
Hystrix	X	X	X	X	X		
Cuon		X	X	X	X		
Ailuropoda melanoleuca	X	X	X	X	X	X	X
Ursus	X	X	X	X	X		
Arctonyx		X	X	X	X	X	
Viverra			X				
Hyaena	X	X	X	X	X		X
Felidae	X	X	X		X		X
Machairodus				X	X		
Palaeomastodon			X		X		
Stegodon	X	X	X	X	X	X	X
Equus			X		X		
Tapirus	X	X	X	X	X	X	
Rhinocerotidae	X	X	X	X	X	X	X
Muntiacus			X		X		
Cervidae	X	X	X	X	X	X	X
Bovidae	X	X	X	X	X	X	X

Research and Discoveries in Hubei, (Wuhan: Wuhan University Press, 1995), p. 3.

Ovinae					X	X	
Vulpes			X	X		X	
Suidae	X	X	X		X		X

Table 1. Comparing Palaeolithic Mammals in the Hubei Region (Source: recreated by the author. (Source: 杨宝成，*《湖北考古研究与发现》*,（武汉：武汉大学出版社，1995），页 3. / Baocheng Yang, *Archaeological Research and Discoveries in Hubei*, (Wuhan: Wuhan University Press, 1995), p. 3.)

Table 1 reveals that the mammalian species across these seven locations are largely similar. The primary members of the Pleistocene fauna in Hubei Province include a diverse mix of species such as porcupines, giant apes, giant pandas, sabre-toothed tigers, sabre-toothed bears, sabre-toothed elephants, horses, dogs, deer, cattle, sheep, cats and foxes. Based on the variety of species and their respective ecological habits, the assemblage of these animals can be classified as a typical 'giant panda-sabre-toothed elephant' type.[71]

During the Palaeolithic era, the Jianghan Plain was predominantly covered by extensive lakes for most of the period. It was only in the late Palaeolithic, with the retreat of these lakes, that land emerged. This natural environment prevented humans and wildlife from accessing the interior of the plain for most of the Palaeolithic era, confining them to mountainous regions. It was only after the substantial retreat of the water bodies that the advantageous natural conditions of the Jianghan Plain attracted both humans and wildlife. A distribution map of Palaeolithic mammal fossil sites clearly shows that two sites are located within the Jianghan Plain, while the remaining five are situated in the western mountainous region of Hubei (Figure 9).

[71] 马安成,汤虎良.<浙江金华全新世大熊猫—剑齿象动物群的发现及其意义>,*《古脊椎动物学报》*,4（1992），页 295-312. / Ancheng Ma, Huliang Tang, 'On Discovery and Significance of a Holocene Ailuropoda – Stegodon Fauna From Jinhua, Zhejiang', *Vertebrata Palasiatica,* 4 (1992), pp. 295-312.

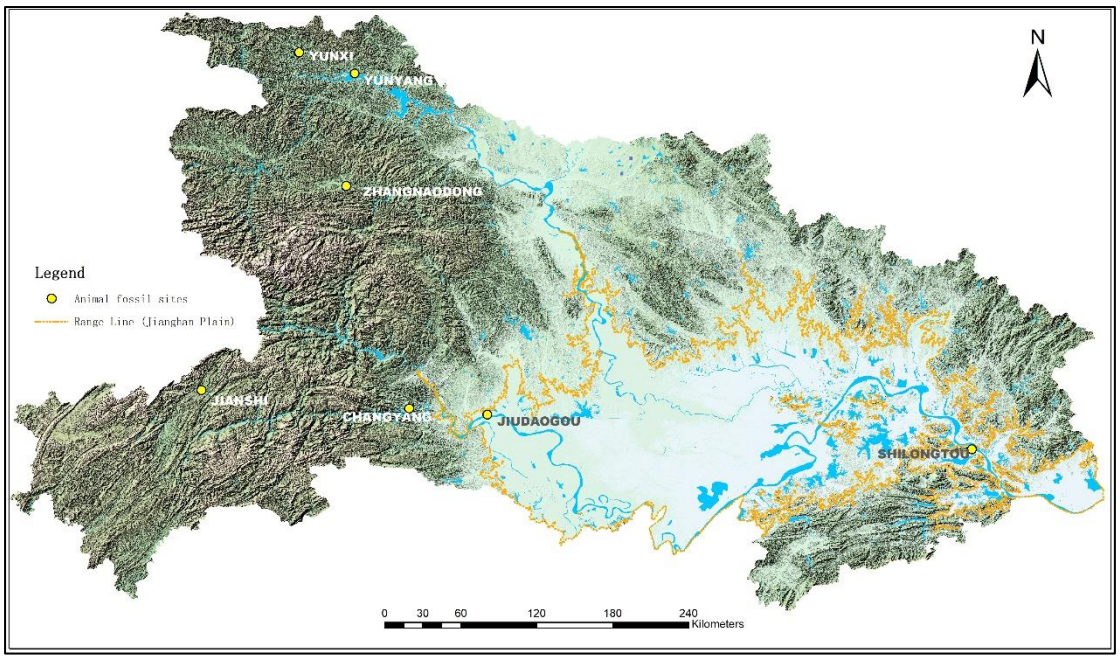


Figure 9. Distribution map of archaeological sites for mammalian fossils from the Palaeolithic period. (Source: created by the author)

According to Table 1, a comparison of mammalian taxa from two fossil sites within the Jianghan Plain region with those from five other sites reveals that, with the exception of species such as Gigantopithecus, macaques, and sabre-toothed tigers, which predominantly inhabited mountainous areas, the principal mammalian species at the two sites are similar to those at the other five sites. These were species which coexisted with early humans. Therefore, this chapter suggests that the Pleistocene fauna of the Jianghan Plain should also be classified within the 'giant panda-sabre-toothed elephant' faunal type.

The 'giant panda-sabre-toothed tiger' faunal assemblage in China is predominantly distributed in the southern regions and has had a significant relationship with human populations.[72] Within this assemblage, some species were natural predators of early

[72] 裴文中，<大熊猫——剑齿象动物群>,《贵州师院学报(社会科学版)》，1（1980），页 1-4. / Wenzhong Pei, 'Giant Pandas—The Fauna of the Saber-Toothed Tiger Epoch', *Journal of Guizhou Normal University (Social Sciences Edition), 1 (1980), pp.1-4.*

humans, while others were hunted by ancient humans and served as a crucial food source. In a world dominated by large animals, early humans were positioned at the end of the food chain, often threatened by hungry predators. During the Palaeolithic era in the Jianghan Plain, animals such as the sabre-toothed bear and sabre-toothed tiger were common. These formidable carnivores, characterized by their immense size and strength, were likely adversaries of early humans. They presented not only a threat but also a challenge to early humans' survival skills and social organization. Conversely, animals such as horses, dogs, deer, cattle, and pigs were more likely to be hunted by ancient humans. Hunting these animals provided essential protein sources for early humans and was a significant driver of social development and cultural evolution.

Lake cluster and wetlands

As a part of the Yangtze River basin, the Jianghan Plain has been shaped into a typical alluvial plain through the erosional and depositional processes of the Yangtze and Han Rivers. These rivers transport substantial amounts of sediment from upstream, which accumulates in the plain, gradually forming fertile land and altering the original landforms over time. Wang and colleagues have estimated the sedimentation rates in the Jianghan Plain over the past 10,000 years, starting from 10,000 years Before Present (B.P.) (Figure 10 & Table 2). They observed that between approximately 7,000 and 4,000 years ago, the sedimentation rate in the Jianghan Plain reached its peak, with sediment thickness also reaching its maximum.[73] This period represents the primary accumulation zone for sediment transported by the Yangtze River. However, in subsequent periods, the sedimentation rate in the Jianghan Plain significantly decreased and has remained low to the present day.

[73] 王张华，Liu J P,赵宝成，<全新世长江泥沙堆积的时空分布及通量估算>，*《古地理学报》*，4（2007），页 419-429 / Zhanghua Wang, J P Liu, Baocheng Zhao, 'Spatial and temporal distribution of Changjiang sediments and estimation of sediment budget during the Holocene', *Journal of Palaeogeography*, 4 (2007), pp. 419-429.

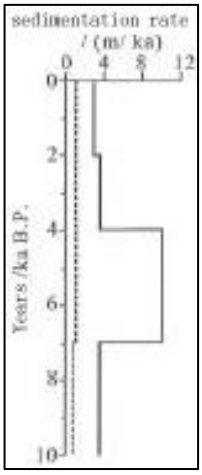


Figure 10. Sedimentation Rates During the Holocene Epoch in the Jianghan Plain Region (Source: 王张华，Liu J P,赵宝成，<全新世长江泥沙堆积的时空分布及通量估算>，*《古地理学报》*，4（2007），页 419-429 / Zhanghua Wang, J P Liu, Baocheng Zhao, 'Spatial and temporal distribution of Changjiang sediments and estimation of sediment budget during the Holocene', *Journal of Palaeogeography*, 4 (2007), pp. 419-429.)

Period / a B. P.	10000-7000	7000-4000	4000-2000	2000-Now
Sediment thickness / m	2.0-10.0	3.0-30.0	2.0-7.0	2.0-6.0
Sedimentation rate / (m/ka)	0.7-3.3	1.0-10.0	1.0-3.5	1.0-3.0

Table 2. The sediment thickness and sedimentation rate of the Jianghan Plain during the Holocene epoch. (Source: 王张华，Liu J P, 赵宝成，<全新世长江泥沙堆积的时空分布及通量估算>，*《古地理学报》*，4（2007），页 419-429. / Zhanghua Wang, J P Liu, Baocheng Zhao, 'Spatial and temporal distribution of Changjiang sediments and estimation of sediment budget during the Holocene', *Journal of Palaeogeography*, 4 (2007), pp. 419-429.)

The Jianghan Plain is a region formed by alluvial and lacustrine deposits, located at the confluence of the Yangtze and Han Rivers. The interaction between these rivers has led to the development of extensive interfluvial depressions. These depressions have further subdivided into additional basins due to the actions of tributaries. Following periods of water accumulation, these depressions could evolve into lakes or marshlands,

collectively forming the renowned ancient Yunmengze lake cluster. By the Neolithic era, the Yunmengze lake cluster had transformed into a lacustrine landscape on the plain.[74] Sima Xiangru (司马相如), in his poem *the Composition of Zixu* (*《子虚赋》*) described the vastness of Yunmengze as 'Yunmeng spans an area of nine hundred square miles', [75] highlighting the immense scale of the lake cluster. The considerable volume of water in the lake cluster led to significant evaporation, generating water vapor and creating a misty, ethereal natural landscape reminiscent of an otherworldly paradise. In the absence of flood control levees during the early period, when the Yangtze and Han Rivers flooded and overflowed their banks, inundating the low-lying areas of the plain and connecting with the major lakes, this natural phenomenon was known to ancient people as Yunmengze.

Sima Xiangru devotes nearly a full passage in *the Composition of Zixu* (*《子虚赋》*), depicting the natural landscape resources of the Yunmengze region, which includes various animal and plant species.

> To the south lies a vast expanse of plains and marshes, where one can ascend and descend through rolling hills, and where altars are laid out gracefully. Bound by the great river and flanked by the Wushan mountain, the high and dry areas are home to wild leeks and water lilies, while the low and moist regions nurture reeds, wild roses, lotus roots, and a multitude of other flora, making the area teeming with life that is beyond description. To the west, there are clear springs and tranquil pools, where rushing waters reveal blooming hibiscus and water chestnuts, while large stones and white sands remain hidden beneath the surface. This area is also inhabited by mythical creatures such as turtles and tortoises. To the north, one finds dense forests, with trees such as the catalpa

[74] 张修桂，<云梦泽的演变与下荆江河曲的形成>，*《复旦学报（社会科学版）》*，2（1980），页 40-48 / Xiugui Zhang, 'The Evolution of Yunmengze and the Formation of the Lower Jingjiang River Meander', *Fudan Journal (Social Sciences Edition)*, 4 (2007), pp. 419-429.

[75] with one square mile equivalent to 0.2 hectares

and the fragrant laurel, along with various aromatic citrus. In these trees, one may observe phoenixes and other birds taking flight, while on the ground, there are white tigers and dark leopards prowling among the underbrush. [76]

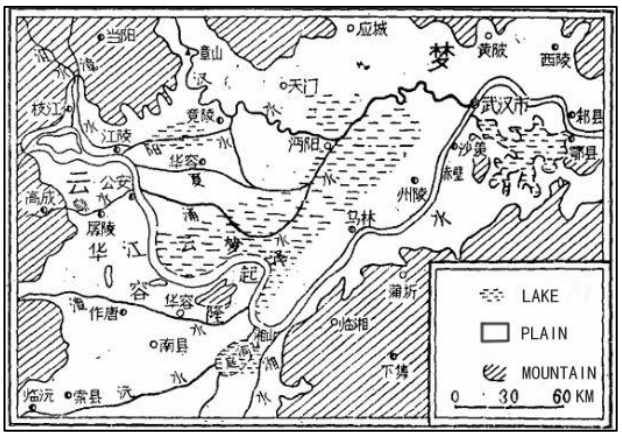


Figure 11. Diagrammatic Representation of the Yunmengze Lake Cluster during the Qin Dynasty. (Source: 张修桂，<云梦泽的演变与下荆江河曲的形成>，*《复旦学报（社会科学版）》*，2（1980），页 40-48，（第 40 页） / Xiugui Zhang, 'The Evolution of Yunmengze and the Formation of the Lower Jingjiang River Meander', *Fudan Journal (Social Sciences Edition),* 4 (2007), pp. 419-429, (p. 40).)

This passage illustrates a vivid depiction of the dynamic natural environment within the Yunmengze Lake cluster. The area is characterized by a diverse array of plant species, including various types of trees, shrubs, herbaceous plants, climbing plants, aromatic plants, and fruit trees. It is also home to a substantial variety of animal species, encompassing reptiles, mammals and birds. These elements collectively contribute to the pristine natural landscape of the Yunmengze Lake cluster.

The Yunmengze Lake Cluster is one of the most important natural landscapes on the Jianghan Plain and serves as a significant aquatic feature in the region. Its presence has had a profound impact on the local natural environment and early human societies. For the inhabitants of the primordial era, the lake cluster was both a source of delight and a challenge. On one hand, it provided an excellent ecological environment, laying the groundwork for settlement and the development of rice agriculture. On the other hand, due to the early inhabitants' limited capacity to alter the natural environment on a large scale, the lake cluster hindered their exploration into the interior of the plain. Prolonged

[76] 司马相如，*《子虚赋》* / Sima Xiangru, *The Composition of Zixu.*

flooding conditions forced these early people to settle in areas far from the lakes.

Historically, the majority of the Jianghan Plain was covered by the ancient Yunmengze lake cluster. However, due to sediment deposition from the Yangtze and Han Rivers, the western part of Yunmengze gradually transformed into land. Prior to the Qin Dynasty, the Jianghan Plain was divided into two distinct regions by the Yunmengze lake cluster, which were situated at the eastern and western ends of the lake cluster (Figure 11). [77] Human settlements were already established in these areas, with most archaeological sites located at the transition zones between the plains and the surrounding hilly areas. This distribution suggests that the region was conducive to human habitation, with fertile soil well-suited for agricultural activities. Subsequently, continuous sediment accumulation from the Yangtze and Han Rivers led to the gradual conversion of the ancient Yunmengze lake cluster into land. This erstwhile vast lake region later became the stage for numerous significant historical events.

During the Neolithic period, frequent climatic fluctuations led to unstable precipitation patterns, which frequently posed the threat of flooding. The ancient Yunmengze Lake Cluster was a vast lake system with a high throughput capacity. [78] During dry periods, the Yunmengze Lake retreated significantly, resulting in the formation of numerous lakes with varying shapes. At this time, mudflats, swamps, forests, dry lands and cultivated fields became exposed, creating a landscape characterized by the coexistence of river valleys, lakes, and depressions on the floodplain. When the flood season arrived, the initially dispersed lakes and depressions would become interconnected due to the influx of floodwaters, forming a unified whole with expanding water surfaces, thus

[77] 张修桂，<云梦泽的演变与下荆江河曲的形成>，*《复旦学报（社会科学版）》*，2（1980），页 40-48 / Xiugui Zhang, 'The Evolution of Yunmengze and the Formation of the Lower Jingjiang River Meander', *Fudan Journal (Social Sciences Edition)*, 4 (2007), pp. 419-429.

[78] 张兰生，方修琦，*《中国古地理》*，（北京：科学出版社，2005），页 349 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 349.

creating the expansive Yunmengze water scenery. Under these conditions, people would be compelled to temporarily relocate from the interior of the floodplain to slightly elevated areas at its edges. To some extent, the ancient Yunmengze Lake Cluster can be likened to a large wetland park (Figure 12).

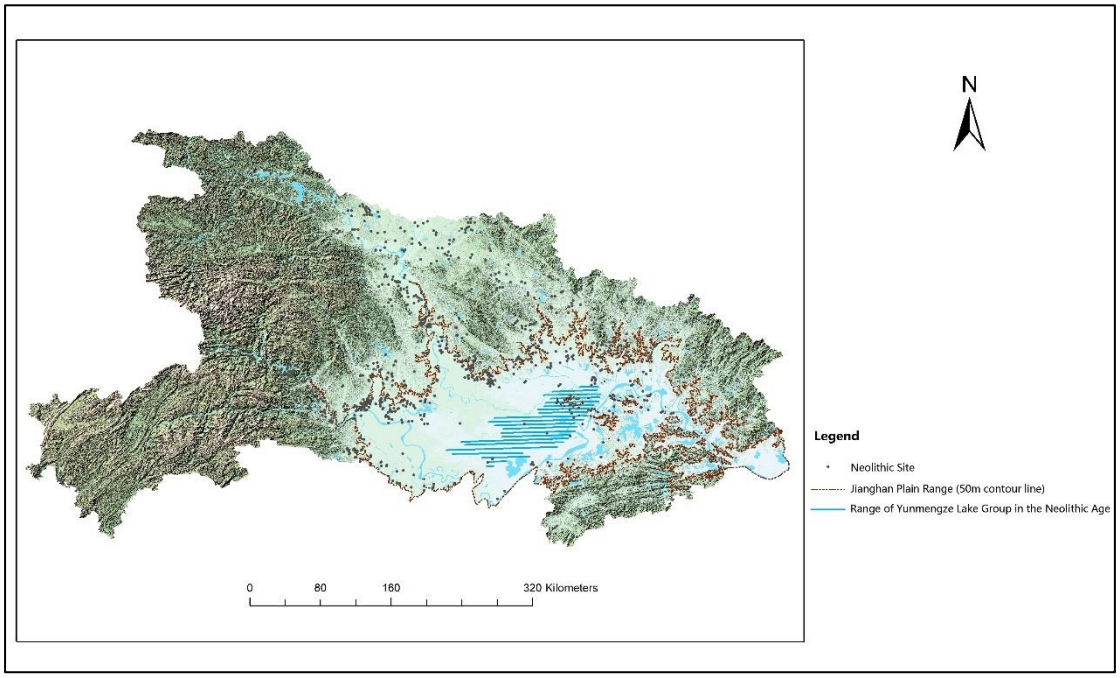


Figure 12. Distribution map of Neolithic Sites in Hubei Province. (Source: created by the author)

Due to the fact that the ancient inhabitants of the Jianghan Plain primarily engaged in rice cultivation, the plain areas surrounding the Yunmengze lake cluster became the optimal choice for human settlement and agricultural production. This can be attributed to the ample water resources and flat terrain of the region. The ancestors were accustomed to this lifestyle and recognized its advantages. Consequently, those who were displaced by floods retained the intention to return to the plain once the floodwaters receded, leading to a cyclical pattern of relocation and resettlement.

Prior to the Qin Dynasty, the geographical landscape of the Jianghan Plain largely remained in a state of natural evolution, as humans lacked the capability to extensively

alter the environment. [79] However, with the advancement of human capacity to modify nature, the early inhabitants of the region recognized the importance of proactive flood prevention. Consequently, individuals from various settlements began collaborating to construct defensive structures to mitigate flood impacts, including city moats, embankments, ditches and river channels. These emerging artificial landscapes partially alleviated human concerns about flooding and also made localized changes to the original natural landscape of the Jianghan Plain.

In the ancient book *Mozi (《墨子》)*, it is recorded: 'Jing has Yunmeng, with rhinoceroses and deer.' [80] This statement indicates that in ancient Yunmengze lake cluster, not only did aquatic animals inhabit the area, but terrestrial animals such as rhinoceroses and deer also lived there, with the deer being wetland species. Another ancient book, *Strategies of the Warring States (《战国策》)*, contains a description of the King of Chu hunting in Yunmengze lake cluster: 'The King of Chu hunted in Yunmeng, with banners blocking the sun and a procession of a thousand chariots.' [81] Together, these descriptions from the two ancient texts suggest that the Yunmengze lake cluster region was home to a diverse array of wildlife.

From the Qin Dynasty to the Tang Dynasty, this period in history marked the retreat of the Yunmengze water body. The establishment of county-level administrative units became a key indicator of changes in the Yunmengze lake cluster's water levels. During the Han Dynasty, the emergence of Huarong and Jingling counties on land represented not only an increase in population and agricultural development but also an expansion of the land area. As the terrestrial delta extended, the ancient Yunmengze lake cluster, which was becoming shallower, gradually shifted southeast. This shift represented a

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[79] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 350 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 3450

[80] 墨子，《*墨子*》 / Mo Zi, *Mozi*

[81] 刘向，《*战国策*》 / Xiang Liu, *Strategies of the Warring States.*

critical turning point in the retreat of the water body.

With the further expansion of the Jianghan Plain, the Yunmengze lake cluster began to silt up and shrink gradually from the Tang Dynasty onwards. The once substantial Yunmengze lake cluster was largely filled with sediment from the Yangtze River's upper reaches, and the '900-Li Yunmengze' [82] praised in *the Composition of Zixu* (*《子虚赋》*) by Sima Xiangru (司马相如) was replaced by scattered small lakes. [83] In the early Northern Song Dynasty, the ruling class established Yusha County near present-day Jianli County to manage and reclaim the newly formed plains. By this time, the historically significant Yunmengze had largely disappeared, and vast lake waters had been replaced by a patchwork of lakes and marshes. From the late Southern Song Dynasty, the construction of polders accelerated the disappearance of the ancient Yunmengze lake cluster and contributed to the formation of the Jianghan Plain. As the Yunmengze water body retreated, the Jianghan Plain gradually took on its current natural landscape. During this transformation, agricultural production within human society advanced almost in parallel, with settlement gradually moving from the edge of the 50-metre contour line to the central regions, ultimately enabling sustained human habitation across the entire Jianghan Plain.

Currently, there exists a national-level nature reserve known as the Shishou Sika Deer National Nature Reserve, situated on the periphery of the ancient Yunmengze Lake region. Spanning approximately 1,567 hectares, the primary objective of this reserve is the conservation of wild elk and their natural freshwater marshland habitat. To the south, the reserve adjoins the Yangtze River, while to the north and east, it is encircled by the old course of the Yangtze River. [84] The western boundary is marked by a flood control

[82] 1- Li is equivalent to 500 metres.

[83] 谭其骧，<云梦与云梦泽>，*《复旦学报（社会科学版）》*，1（1980），页 7-17，（第 9 页） / Qiqiang Tan, 'Yunmeng and Yunmengze Lake cluster', *Fudan Journal (Social Sciences Edition),* 1 (1980), pp. 7-17, (p. 9).

[84] Hubei Daily, 'The Shishou Wetland is progressively emerging as a global biodiversity hotspot', Department of

levee, beyond which lies an agricultural area (Figure 13).

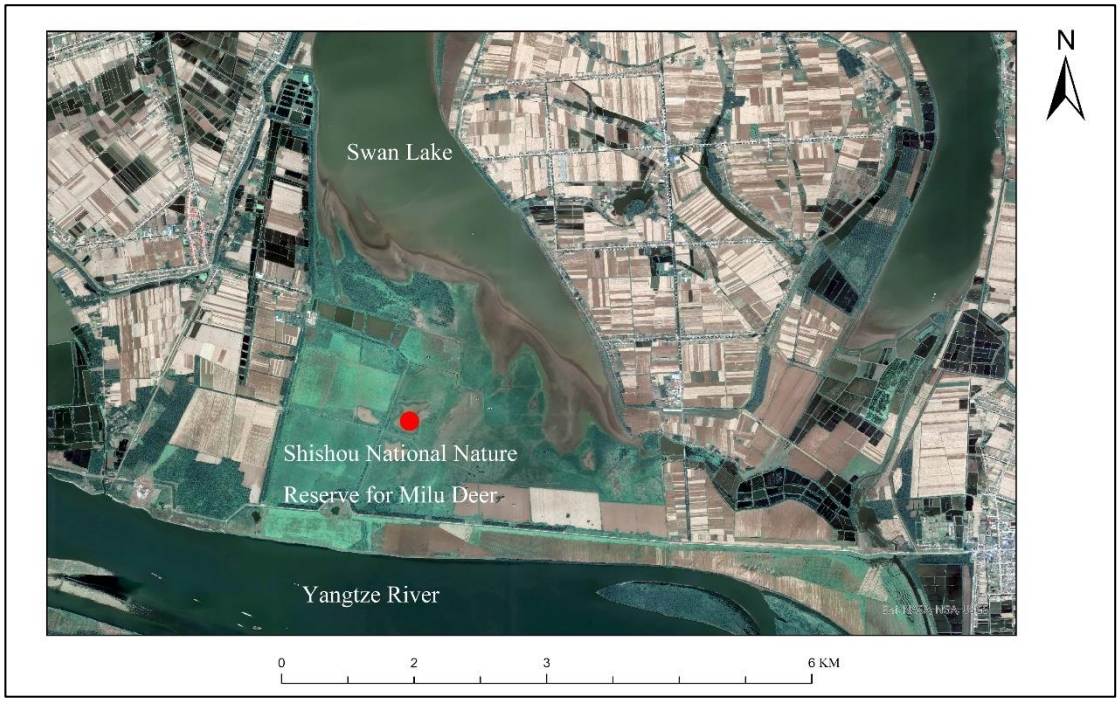


Figure 13. Map of Shishou National Nature Reserve for Elk. (Source: based on the Google Earth)

The climate in this region is characterized by warmth and humidity, with abundant water, vegetation, and diverse plant species, creating an ideal habitat for elk. Field observations reveal numerous elk either standing or lying in the water, leisurely basking in the sunlight. Additionally, herons, wild geese, and various unidentified bird species occasionally fly past them (Figure 14).



Figure 14. Shishou National Nature Reserve for Elk. (Source: Hubei Daily, 'Encountering Shishou: Exploring the Habitat of Two National Treasures', Hubei Daily, 2023, <https://news.hubeidaily.net/mobile/c_1933981.html>, [accessed 03 December 2023])

Ecology and Environment of Hubei Province (2012), <http://sthjt.hubei.gov.cn/dtyw/hjxw/201206/t20120613_548436.shtml>, [accessed 17 June 2021].

Most of the land within the nature reserve consists of reed marsh wetlands formed by the continuous sedimentation from the Yangtze River. These wetlands feature soils rich in organic matter and nutrients. Coupled with the area's ample moisture and abundant rainfall, these conditions create an ideal environment for the growth of reeds, dogtooth grass, alfalfa and various sedge species. These plants often constitute the natural diet of herbivorous animals, including the elk. The forested areas, grasslands and marshes serve as the primary habitats for the elk, with tall reed beds and woodlands providing shelter, protection from the elements and resting places.

According to the information provided on the website of the Department of Ecology and Environmental of Hubei Province, this region is home to a diverse array of aquatic plants. These include submerged plants such as 'Potamogeton' and 'Vallisneria', floating plants like 'Trapa' and 'Eichhornia', emergent plants including 'Zizania', 'Schoenoplectus', and 'Phragmites', as well as various marsh vegetation such as 'Cyperus', 'Polygonum', 'Nymphoides', 'Echinochloa', 'Artemisia' and numerous leguminous species. Among these, 'Phragmites' and 'Schoenoplectus' communities are predominant, alongside extensive shallow-water meadows and dense willow shrublands. [85]

Additionally, in terms of animal resources, aside from the elk, this region is home to terrestrial animals such as badgers, rabbits, and hedgehogs; aquatic species including swans, egrets, river dolphins, Chinese sturgeons and giant salamanders, as well as avian species. [86]

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[85] Department of Ecology and Environment of Hubei Province, 'The landscape characterized by the 'scattered aquatic plants and low-flying birds' will be recreated in Honghu Lake.', Department of Ecology and Environment of Hubei Province (2006), <http://sthjt.hubei.gov.cn/dtyw/hjxw/200611/t20061101_539231.shtml>, [accessed 17 June 2021].

[86] Hubei Daily, 'The Shishou Wetland is progressively emerging as a global biodiversity hotspot', Department of Ecology and Environment of Hubei Province (2012),

Regrettably, it is no longer possible to observe the magnificent scenery of the ancient Yunmengze Lake Cluster. However, we can at least glean a sense of what the ancient inhabitants might have witnessed from the natural reserves that have survived from the once expansive lake cluster on the Jianghan Plain.

As Modified/Influenced by Human

The initial place of habitation

Approximately one million years ago, a group of Homo erectus, designated as the Yunxian people, emerged in the Han River Basin. They represent the earliest known hominins discovered in Hubei Province to date.[87] Their appearance marks the beginning of the narrative of early human habitation and development in the middle Yangtze River region.

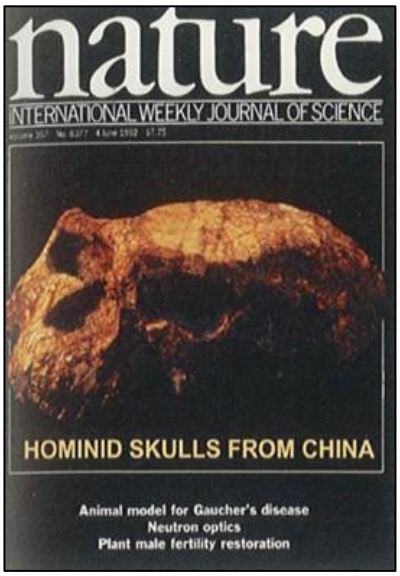


Figure 15. The front page of the 357th edition of the scientific journal Nature from 1992 (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 31 / Miao Yu, *'Prehistoric times in the middle reaches of the Yangtze River',* (Wuhan: Wuhan University Press, 2020), p. 31.)
<http://stnjt.nuoei.gov.cn/qtyw/njxw/201206/t20120613_548436.shtml>, [accessed 17 June 2021].

As the largest tributary of the Yangtze River, the Han River was a relatively young watercourse during that period, characterized by a broad surface and stable flow. The Han River Basin featured fertile land, a mild climate, dense vegetation, and abundant wildlife, making it an ideal location for human habitation. The

[87] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 25 / Miao Yu, *'Prehistoric times in the middle reaches of the Yangtze River',* (Wuhan: Wuhan University Press, 2020), p. 25.

inhabitants of Yunxian County, located in the western part of Hubei Province and adjacent to the Han River, lived in a region characterized by typical hilly terrain. Although the discovery site of the Yunxian people is not within the Jianghan Plain, it is in close proximity and shares similar geomorphological and climatic features. Analysing the living environment of the Yunxian people provides valuable insights into the subsistence patterns of Palaeolithic humans in the region and their strategies for adapting to the natural environment. Consequently, the archaeological data related to them hold significant reference value for reconstructing the ecological environment and human activity patterns of the Jianghan Plain during the same period (Figure 15).

In a cave known as Longgudong, archaeologists discovered fossils of the Yunxian people along with various stone tools used for daily life. [88] The terrain surrounding the cave is relatively flat, offering a wide field of vision, and it is situated approximately 40 metres from a river, making it an ideal dwelling location. [89] It is likely that the Yuncheng people slightly modified the cave floor before deciding to settle there. The findings at this site suggest that, at least during the Palaeolithic age, people may have preferred to reside in elevated areas near water sources. The geographical features of this location, which is backed by hills and faces a river, likely provided them with a sense of security.

According to the previous discussion, the inhabitants of Yunxian coexisted with a faunal assemblage including 'giant pandas' and 'sabre-toothed cats' within their living environment. During the low-productivity Palaeolithic era, life for the Yunxian people was arduous and challenging. They likely relied on stone tools fashioned along

[88] 许春华，<湖北郧县猿人化石地点的发掘>，*《古人类论文集》*，（北京：科学技术出版社，1978） / Chunhua Xu, 'Excavation of the Hubei Yunxian Homo erectus Fossil Site ', *Collected Papers on Early Humans*, (Beijing: Science and technology of China press, 1978).

[89] 杨宝成，*《湖北考古研究与发现》*，（武汉：武汉大学出版社，1995），页 9 / Baocheng Yang, *Archaeological Research and Discoveries in Hubei*, (Wuhan: Wuhan University Press, 1995), p. 9.

riverbanks to contend with these wild animals—both for hunting to obtain food and pelts, and to protect their homes from predatory threats. Over time, geological changes led to the uplift of the Qinling Mountains, causing the Han River to exhibit a subsiding trend. This geomorphological transformation narrowed the initially broad river basin, converting the former riverbanks into elevated terrain over the course of time, resulting in the current landscape (Figure 16).



Figure 16. Place of birth of the Yunxian People in the Palaeolithic Age (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 24 / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), p. 24.)

It is noteworthy that Palaeolithic humans tended to inhabit elevated areas in close proximity to water sources. This strategic choice facilitated easy access to water while also enabling rapid relocation to higher ground during flooding events, thereby safeguarding their safety.

The discovery of the Yunxian Man Homo erectus fossils provides important insights into the study of ancient human populations in the middle Yangtze River region. As the earliest Homo erectus specimen found to date in Hubei Province, the Yunxian individual dates back approximately one million years. Although the site is located in the hilly terrain of the Han River basin rather than the Jianghan Plain, both areas belong

to the central geographical unit of China and share similar topographical and climatic features. This connection makes the Yunxian discovery particularly valuable for exploring early human habitation patterns in the Jianghan Plain.

From an ecological perspective, the Han River basin during the Palaeolithic period offered fertile land, a mild climate, and abundant plant and animal resources, creating an ideal environment for human survival. The Yunxian Homo erectus chose to settle at Longgudong Cave, situated just 40 meters from the river. This strategic location, sheltered by hills and facing the river, facilitated easy access to water and provided natural defences against wild animal attacks, demonstrating early human adaptability to their environment. Notably, this settlement strategy may have also applied to the Jianghan Plain. As an alluvial plain formed by the confluence of the Yangtze and Han rivers, the Jianghan Plain is characterized by flat terrain and a dense river network, which shares ecological similarities with the "river-adjacent elevated terrain" preferred by the Yunxian settlers. This suggests that early humans in the Jianghan Plain may have similarly favoured locations that balanced resource access with security.

Furthermore, the stone tools and fossils of the "giant panda - sabre-toothed tiger" faunal assemblage unearthed at the Yunxian site reflect the interactions between Palaeolithic humans and their environment. The evolution of this human-environment relationship provides valuable insights into early human activities in the Jianghan Plain. Despite significant geological changes, such as the uplift of the Qinling Mountains that narrowed the river's course and transformed riverbanks into elevated landforms, the strategies and settlement patterns of ancient humans remain crucial for reconstructing the early settlement landscapes of the Jianghan Plain. Comparative analysis of these patterns enhances our understanding of the common features and evolutionary trends in ancient human habitation across the middle Yangtze River region.

The earliest settlement

Climate, environment, and humanity are all subject to change. During the Palaeolithic era, human migration was a norm; people moved to areas abundant in food and offering safety and comfort. Typically, they followed river valleys and ventured into previously unexplored regions, as if wandering slowly across the land. Archaeological evidence reveals that in the distant Stone Age, ancestors living in the mid-reaches of the Yangtze River gradually adapted to environmental changes. They migrated from the mountains to the plains, moving eastward toward lower altitudes. [90] A group of these early settlers, arriving for the first time in the Jianghan Plain, came upon the Chick Mountain site, which proved to be a hospitable environment. They were fortunate, as the abundant natural resources surrounding the site ensured survival in an era reliant solely on hunting and gathering. Consequently, they chose to abandon their nomadic lifestyle and establish a settled community in this favourable location.

During the late Palaeolithic period, the landscape of the Jianghan Plain underwent significant alterations. On one hand, natural changes led to the retreat of lakes within the plain, resulting in the development of a river network plain landscape. On the other hand, the arrival of humans introduced various anthropogenic modifications to the originally natural terrain. The area surrounding human settlements became the primary locus of these changes. Consequently, such campsites can be regarded as the earliest human landscapes on the Jianghan Plain, representing the first visible anthropogenic features within this region. [91]

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[90] Yiyin Li, Jing Wu, S. Hou, Chenxi Shi, Duowen Mo, B. Liu and Liping Zhou. 'Palaeoecological records of environmental change and cultural development from the Liangzhu and Qujialing archaeological sites in the middle and lower reaches of the Yangtze River', *Quaternary International*, 1 (2010), pp. 29-37.

[91] 刘德银，王幼平，〈鸡公山遗址发掘初步报告〉，*《人类学学报》*，2（2001），页 102-114 / Deyin Liu, Youping Wang, 'A Preliminary Report on the Excavation of Jigongshan Site', *Acta Anthropologica Sinica*, 2 (2001), pp. 102-

Today, the fields surrounding the Jigongshan site do not exhibit indicators of an ancient era; rather, they display a degree of urbanization. However, archaeological interventions can effectively reveal the physical remnants of past human activities in this area, such as lithic production sites. This provides a unique perspective for historical landscape studies concerning Palaeolithic human life.

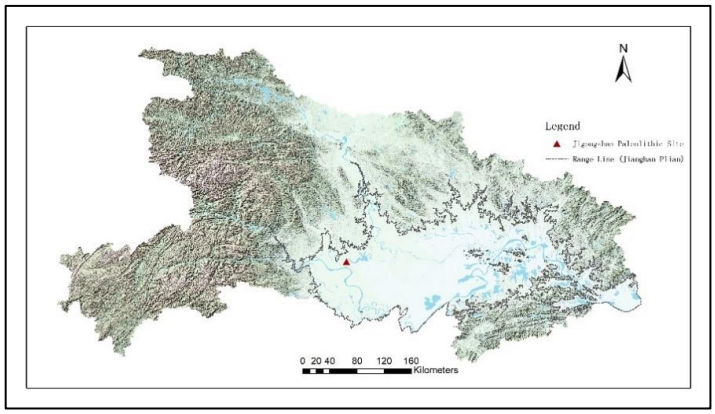


Figure 17. location of the Jigongshan site (Source: created by the author)

The Jigongshan site (鸡公山遗址) is one of the few known Palaeolithic plain sites discovered by archaeologists to date. Based on archaeological estimates, the site dates back to between 50,000 and 40,000 years ago, representing the Late Palaeolithic period.[92] It is situated on the left bank of the Yangtze River in the heart of the Jianghan Plain, adjacent to a small tributary of the Changhu Lake to the northwest, approximately 8 kilometres from the Yangtze River (Figure 17). The site is located on an elevated mound about 7 metres above the surrounding terrain, with an elevation of approximately 45-50 metres. The area covered by the site is roughly 500 metres in length from north to south and 100 metres in width from east to west.

Evidence unearthed by archaeologists provides significant insights into human activities during the Upper Palaeolithic period. Within the excavation area in the

114.

[92] Garcia-Diez, Marcos, and Manuel Vaquero, 'Looking at the camp: Paleolithic depiction of a hunter-gatherer campsite.', PLoS *One*, 10 (2015).

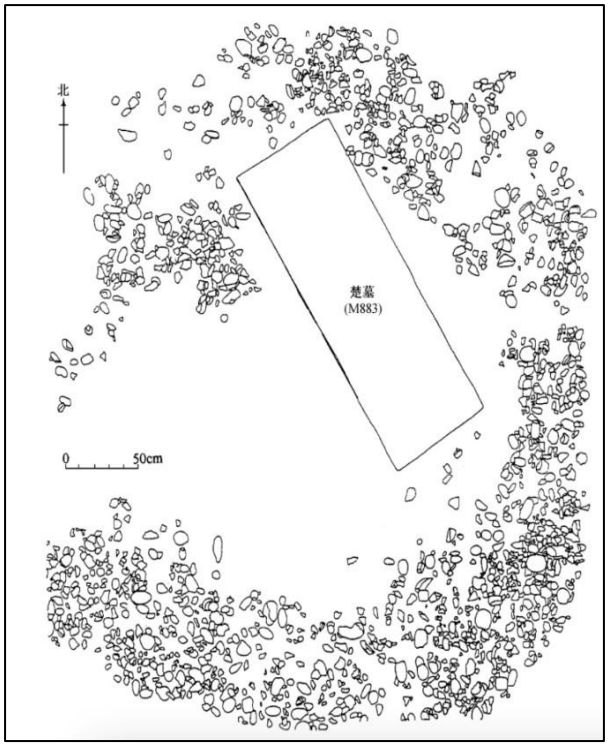


Figure 18. The Plan of Stone Circle (Source: 刘德银，王幼平，<鸡公山遗址发掘初步报告>，*《人类学学报》*，2（2001），页 102-114，（第 106 页） / Deyin Liu, Youping Wang, 'A Preliminary Report on the Excavation of Jigongshan Site', *Acta Anthropologica Sinica*, 2 (2001), pp. 102-114, (p.106).)

northern section of the site, several stone circles with unique structures stand out conspicuously against their surroundings, clearly indicating human creation. These stone circles are primarily composed of gravel and other stone materials from nearby riverbanks and form somewhat irregular ring-shaped structures (Figure 18). Each stone circle has an outer diameter of approximately 4 metres and an inner diameter of about 2 metres. Inside these ring-shaped structures, on the ground within a diameter of approximately 2 metres, tools such as pointed implements and choppers were discovered. [93] These findings suggest that the structures may have served as the foundations for circular shelters used for habitation. The presence of these foundational remains indicates that humans at that time possessed the ability to construct relatively complex residential structures, reflecting a certain level of social organization and technological capability. [94]

[93] 刘德银，王幼平，<鸡公山遗址发掘初步报告>，*《人类学学报》*，2（2001），页 102-114 / Deyin Liu, Youping Wang, 'A Preliminary Report on the Excavation of Jigongshan Site', *Acta Anthropologica Sinica*, 2 (2001), pp. 102-114.

[94] 吴梅，<重返"窝棚"-为当今建筑的出路寻找线索>，*《南方建筑》*，1（1997），页 44-47 / Mei Wu, 'Returning to 'Shantytowns': Seeking Clues for the Future of Contemporary Architecture.', *South Architecture*, 1 (1997), pp. 44-47.

In archaeology, the remains of huts are often manifested through specific surface arrangements and structures. For instance, the layout of circular or semi-circular ground patterns can indicate the outline of primitive dwellings. At numerous ancient sites, circular or elliptical stone circles have been discovered, which may represent the foundational structures of such huts. Consequently, this paper hypothesizes that as early as the late Palaeolithic period, some early humans chose to leave natural shelters like caves and moved to the Jianghan Plain to embark on a new way of life.

On the vast and expansive plains, while modern perspectives might deem the area highly suitable for habitation, it presented a treacherous environment for Palaeolithic humans, who lacked advanced tools and had low productivity. During this ancient era, the Jianghan Plain, inhabited by large predatory animals, appeared particularly inhospitable to the early human settlers. This unfamiliar and hostile environment compelled them to urgently seek alternative shelters. However, locating a refuge similar to the caves they were accustomed to was highly challenging on the plains. Consequently, they had to rely on their ingenuity and physical effort to construct viable living spaces. The advent of huts offered hope to Palaeolithic humans on the plains by providing essential shelter. [95] These early structures were typically made from branches scattered in the forest, forming the framework of the hut, while leaves or animal hides were used to cover the roof, creating a liveable space that shielded them from wind, rain, and the threats posed by adverse weather and wildlife (Figure 19). Even today, huts resembling those from ancient times can still be seen in the fields of the Jianghan Plain, often serving as temporary structures for farmers to rest and store agricultural tools (Figure 20).

[95] 吴梅，〈重返“窝棚”-为当今建筑的出路寻找线索〉，*《南方建筑》*，1（1997），页 44-47 / Mei Wu, 'Returning to 'Shantytowns': Seeking Clues for the Future of Contemporary Architecture.', *South Architecture*, 1 (1997), pp. 44-47.



Figure 19. Simulating the Reconstruction of Shelters for Palaeolithic Humans (Source: hand-drawn by the author, based on 吴梅，<重返“窝棚”-为当今建筑的出路寻找线索>,*《南方建筑》*, 1 (1997)，页 44-47 / Mei Wu, 'Returning to 'Shantytowns': Seeking Clues for the Future of Contemporary Architecture.', *South Architecture*, 1 (1997), pp. 44-47.)



Figure 20. A rudimentary dwelling situated adjacent to agricultural fields in the Jianghan Plain. (Source: captured by the author)

In addition to the residential structures, the southern part of the site exhibits a dense distribution of stone cores and flakes, accompanied by a significant number of stone hammers and anvils. Notably, within one of the processing areas, archaeologists have uncovered seats used for sitting while crafting stone tools, as well as depressions for placing the feet. [96] These archaeological findings suggest that this area may have functioned as a stone tool manufacturing site, consistent with the characteristics of communal living in prehistoric times.

Overall, the Jigongshan site represents a location of prolonged human habitation. Although agriculture had not yet emerged during the Palaeolithic era, the relatively low population density and ample natural resources in the surrounding area sufficiently met the daily needs of the site's early inhabitants, rendering them relatively fortunate compared to other human groups still wandering in the wilderness. The overall

[96] 刘德银，王幼平，<鸡公山遗址发掘初步报告>，*《人类学学报》*，2（2001），页 102−114 / Deyin Liu, Youping Wang, 'A Preliminary Report on the Excavation of Jigongshan Site', *Acta Anthropologica Sinica*, 2 (2001), pp. 102-114.

landscape of the Jigongshan site reveals that the early human campsites of the Jianghan Plain during the Palaeolithic period can be divided into residential and work areas. These characteristics provide insights into the daily life and technological capabilities of late Palaeolithic humans. The circular hut foundations in the residential area indicate the complexity of the dwelling structures, while the details from the stone tool production area offer a deeper understanding of craftsmanship and daily practices. To some extent, these campsites can be viewed as precursors to settlements, laying the groundwork for future settlement development.

Conclusion

This chapter began by analysing palaeobotanical literature to determine the types and distribution of vegetation on the Jianghan Plain during the Palaeolithic era and to infer climatic conditions. It also examined animal fossils to reflect the dietary sources and faunal communities in the ancient human environment. Subsequently, using data collected from literature, Geographic Information System (GIS) technology was employed for landscape simulation and reconstruction to recreate the lakes and wetlands of the Palaeolithic Jianghan Plain, providing a more intuitive understanding of the region's hydrological landscape features. Finally, based on archaeological literature research, the chapter identified Palaeolithic settlement sites discovered for the first time in the plain region, offering significant clues for studying human activities of that period. Field investigations of ancient human settlements, such as habitation sites and stone tool workshops, reveal insights into the daily life and technological capabilities of late Palaeolithic humans.

It can be inferred that during the Palaeolithic period, the Jianghan Plain was characterized by an abundance of rivers, lakes, and other water bodies, which provided ample water resources and contributed to the formation of numerous tributaries, river

channels, and wetland landscapes such as lakes and swamps. These aquatic environments not only supplied water for the human populations of the time but also fostered a rich array of aquatic life. The climate during the Palaeolithic era was marked by continuous changes but was generally warm and humid, which favoured the growth and reproduction of both flora and fauna. Such climatic conditions resulted in lush vegetation across the Jianghan Plain and a high level of biodiversity. The warm and humid climate supported extensive forest growth, including a variety of tree species such as evergreen broadleaf forests and deciduous broadleaf forests. These forests provided abundant resources for early humans. The rich vegetation and aquatic environments created suitable habitats for a diverse range of animals, potentially including large mammals such as giant pandas and sabre-toothed tigers, as well as numerous bird species, fish, reptiles, and insects. These animals constituted important food sources for Palaeolithic humans and were the targets of their hunting and gathering activities. By the Late Palaeolithic period, human presence began to emerge in the vicinity of the Jianghan Plain, with early humans likely choosing to reside near water sources in higher and drier areas, either living directly in caves or constructing shelters. Overall, the landscape of the Jianghan Plain during the Palaeolithic era was primarily shaped by natural processes, with minimal human impact at this stage, but it laid the groundwork for subsequent developments in the region’s landscape.

Chapter 3. Neolithic Age: The landscape of early agriculture and settlement formation

Introduction

The most crucial factor shaping the Chinese landscape is not climate, soil, or vegetation, but rather its people. [97] The emergence of agriculture represents humanity's initial attempt to transform nature and marks the onset of the Neolithic era. [98] In China, the Neolithic period began around 7000 BCE during the early Holocene warming phase and lasted for approximately 5000 years. [99] During this time, humanity transitioned from the Palaeolithic era, characterized by a reliance on hunting and gathering for subsistence, to the agricultural civilization of the Neolithic era. Some individuals abandoned the freedom of a nomadic lifestyle and chose to settle in a specific location, engaging in reproduction and livelihood activities, thereby facilitating a shift from a mobile to a sedentary mode of life.

This represents a new adventure, as this group of humans has chosen to undergo transformation in the entirely new Neolithic era. The most notable change was the transition from a nomadic, migratory existence to a settled lifestyle. From this point forward, humans forged a close connection between their destiny and the land, an association that was likely unforeseen in its profound and indelible impact at the time. As modern individuals, we recognize that the concept of 'land' has become an integral

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[97] 葛德石，*《中国的地理基础》*，（台北：开明书店，1934）/ Deshi Ge, *Geographical Foundations of China*, (Taipei: Kaiming Bookstore, 1934).

[98] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 132 / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 132.

[99] 张正明，刘玉堂，*《湖北通史. 先秦卷》*，（武汉：华中师范大学出版社，1999），页 81 / Zhengming Zhang, Yutang Liu, *General History of Hubei. Pre-Qin Volume,* (Wuhan: Central China Normal University Press, 1999), p. 81.

part of the lives of the Chinese people from this moment onward. This transformation has been unprecedented in its scope for the entire Chinese territory. As Hoskins has acknowledged, every alteration on the land serves as a testament to history and an accumulation of culture. For China as a whole, the land is now undergoing a change driven by an unprecedented 'force,' a force emanating from humanity itself.

In the context of the Neolithic era, the Yangtze River basin serves as a representative origin of ancient civilizations in southern China, with the Jianghan Plain as the core area for the emergence of civilization in the central Yangtze River region. The inhabitants of this area are particularly fortunate, as they reside in one of China's most suitable regions for rice cultivation. The Jianghan Plain, characterized by its abundant waterways, provides residents with convenient access to waterborne transportation. However, while benefiting from the advantageous environment created by the Yangtze River and its tributaries, those living in the basin also face the challenge of flooding. Humanity has begun to attempt to control and alter nature, yet simultaneously has learned to depend on and respect it. In the writings of Hoskins, the rural landscape of England is portrayed as a product of the interaction between human activity and the natural environment. Similarly, on the Jianghan Plain, every transformation of the land is the result of the interplay between human ingenuity and the forces of nature.

In the Jianghan Plain, and indeed throughout China, there is no information from the Neolithic period conveyed through written records. Consequently, archaeological reports become a crucial source for reconstructing the narratives of human-environment interactions from that distant era. The historical data 'unearthed' by archaeologists provide a significant reflection of the landscape's authentic character. Thanks to the rapid development and abundant findings of archaeological research in the Yangtze River middle reaches over the past 50 years, many ancient traces buried beneath the vast expanse of the Jianghan Plain can still be traced with the assistance of

archaeologists.

In this chapter, the article will examine how the landscape within the Jianghan Plain region has been shaped by the interplay between human activity and the natural environment, according to the chronological divisions of the Neolithic archaeological cultures in the middle Yangtze River region. The types of pottery are one of the most significant markers for distinguishing different cultural periods of the Neolithic era, as the initial traces of pottery can indicate the onset of specific archaeological cultures. Based on current archaeological findings, this study categorizes the Neolithic period of the Jianghan Plain into four distinct phases, in accordance with the widely accepted classification in contemporary archaeology: the Chengbeixi Culture Period (6500 BCE–5000 BCE); the Daxi Culture Period (5000 BCE–3300 BCE); the Qujialing Culture Period (3300 BCE–2500 BCE); and the Shijiahe Culture Period (2500 BCE–2000 BCE) (Table 3).

Neolithic Age Archaeological Culture	Approximate Age	Core Areas of Ruins	Period
Chengbeixi Culture	6500 BC - 5000 BC	The hilly area between the east of the Three Georges of the Yangtze River and the periphery of the west side of the Jianghan Plain	Middle Neolithic
Daxi Culture	5000 BC - 3300 BC	The east of the Three Gorges and the west of the Jianghan Plain	Mid-Late Neolithic
Qujialing Culture	3300 BC - 2500 BC	The Jianghan Plain	Late Neolithic
Shijiahe Culture	2500 BC - 2000 BC	The Jianghan Plain	End of the Neolithic

Table 3. Four archaeological periods in the Neolithic Age (Source: created by the author)

Due to the influence of rising sea levels and new tectonic movements, certain low-lying

areas of the Jianghan Plain have developed scattered lakes. This distinctive geomorphological feature results in the entire plain exhibiting a widespread flow during flood periods, while in dry seasons, the landscape alternates between river and lake systems. [100]

In the early Neolithic period, the Yangtze River Basin experienced a period of rising temperatures, characterized by a climate that was warmer and more humid than today. The average annual temperature during this time was approximately 18℃, and annual precipitation exceeded 1300 millimetres. [101] This period saw the widespread formation and expansion of lake systems in the Jianghan Plain, with frequent flooding rendering the area unsuitable for human habitation. Consequently, there is no evidence of Neolithic human civilization in the Jianghan Plain during this early phase.

It was not until the mid-Neolithic period that archaeological research began to reveal scattered human settlements on the peripheries of the plain, all situated in the hilly areas. The evidence discovered indicates that some early inhabitants chose to settle in the Jianghan Plain as the frequency of flooding diminished. Despite the reduction in flood risk compared to earlier periods, caution was still necessary, and settlements were strategically located on elevated and hilly terrains to effectively avoid potential flooding.

The Qujialing Culture period represents the most favourable climatic phase for the Jianghan Plain during the Holocene epoch. [102] This conducive environment prompted

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[100] 鲁西奇,*《区域历史地理研究：对象与方法-汉水流域的个案考察》*,(北京：社会科学文献出版社，2019)，页 50-51 / Xiqi lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Vally*, (Beijing: Social Science Academic Press (China), pp. 50-51.

[101] 鲁西奇,*《区域历史地理研究：对象与方法-汉水流域的个案考察》*,(北京：社会科学文献出版社，2019)，页 45 / Xiqi lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Vally*, (Beijing: Social Science Academic Press (China), p. 45.

[102] 闾国年,*《长江中游湖盆三角洲的形成与演变及地貌的再现与模拟》*,(北京：测绘出版社，1991）/ Guonian

a significant return of early settlers to the Jianghan Plain, where the advantageous natural conditions facilitated the rapid development of rice cultivation civilization. Due to population growth and advancements in production technology, the emergence of moated settlements on the Jianghan Plain during the Qujialing period marked a substantial progression from the dispersed settlements characteristic of the Daxi Culture period. This period of tranquillity lasted for approximately 1,000 years; however, with the onset of another flood cycle, the peace of the early inhabitants was disrupted, prompting migration to the higher elevation regions north of the plain and leading to their departure from the lowland areas. [103]

During the late Neolithic period, the Shijiahe Culture represented the zenith of prosperity in the Jianghan Plain. The plain was home to numerous settlements of varying sizes, including those with defensive moats. The Shijiahe site is particularly notable as one of the most representative large central settlements of the Neolithic era in the Jianghan Plain. Although the inhabitants of this period had begun to construct flood control measures, the limitations of their technological capabilities, coupled with rising temperatures and ensuing floods, ultimately led to the decline of the Shijiahe Culture.

Additionally, human survival and development are inextricably linked to the natural environment and biological resources. This was particularly evident during the Neolithic era, when high-quality ecological resources were essential for the subsistence

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Lv, The formation, evolution, and geomorphological representation and simulation of the middle Yangtze River basin delta, (Beijing: Surveying and Mapping Press, 1991).

[103] 蔡述明，官子和，〈跨江南北的古云梦泽说是不能成立的-古云梦泽问题讨论之二〉，*《海洋与湖沼》*，2（1982），页 129-142 / Guonian Lv, 'The formation, evolution, and geomorphological representation and simulation of the middle Yangtze River basin delta', Oceanologia et Limnologia Sinica, 2 (1982), pp. 129-142.

and advancement of early humans. [104] The Jianghan Plain, located in the subtropical monsoon climate zone of the Yangtze River's middle and lower reaches, features predominantly subtropical evergreen and deciduous broadleaf mixed forests. [105] Due to its geographical location, the Hubei region experiences pronounced seasonal variations, ample rainfall, and relatively sufficient sunlight. The unique characteristics of the Jianghan Plain contribute to exceptionally fertile soil. These advantageous conditions support vigorous plant growth and abundant fruit and vegetable production. Mammals also constitute an indispensable component of the human diet. Archaeological findings have revealed numerous mammal fossils associated with human remains at ancient settlement sites in the Jianghan Plain. [106] At the Shijiahe site, archaeologists discovered a variety of ceramic figurines depicting small animals, including domestic mammals such as dogs, pigs, chickens, sheep and rabbits (Figure 21). [107] While it is not yet clear whether these animals were being domesticated on a large scale at the time, it is evident that such domestic mammals were already present in the daily life of the Jianghan Plain's Neolithic inhabitants. This favourable natural environment enabled the Neolithic people to settle in the Jianghan region for extended periods and laid the groundwork for the emergence and development of agriculture.

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[104] 杨宝成，*《湖北考古研究与发现》*，（武汉：武汉大学出版社，1995），页 2–3 / Baocheng Yang, *Archaeological Research and Discoveries in Hubei*, (Wuhan: Wuhan University Press, 1995), pp. 2-3.

[105] Guoyu Ren, Hans-Juergen Beug. 'Mapping Holocene pollen data and vegetation of China', *Quaternary Science Reviews*, 21 (2002), pp. 1395-1422.

[106] 杨宝成，*《湖北考古研究与发现》*，（武汉：武汉大学出版社，1995），页 2–3 / Baocheng Yang, *Archaeological Research and Discoveries in Hubei*, (Wuhan: Wuhan University Press, 1995), pp. 2-3.

[107] 孟华平，刘辉，向其芳．〈湖北天门市石家河古城谭家岭遗址 2011 年的发掘〉．*《考古》*，3（2015），页 51–73 / Huaping Meng, Hui Liu, Qifang Xiang, 'Excavation of the Tanjialing Site in Shijiahe Ancient City, Tianmen City, Hubei Province in 2011', *Archaeology,* 3 (2015), pp. 51-73.

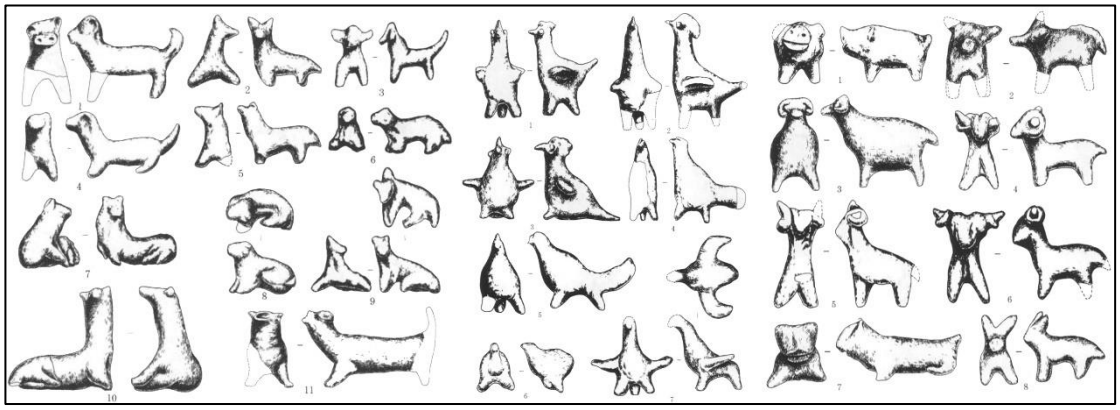


Figure 21. Shijiahe culture ceramic figurines of fauna (Source: 王劲，〈浅议石家河文化陶塑艺术〉，*《华夏考古》*，4 （2011），页 51−78 / Jin Wang, 'A Brief Examination of the Ceramic Sculpture Art of the Shijiahe Culture', *Huaxia Archaeology*, 2 (2011), pp. 51-78.)

In the Neolithic period, the introduction of agriculture constituted a significant factor in landscape transformation. Concurrently, the advancement of agriculture also influenced the formation and modification of settlement patterns to a certain extent. Against this backdrop, this chapter will examine the formation and evolution of the landscape in the Jianghan Plain during the Neolithic era from two perspectives: 1. agricultural landscapes; 2. settlement patterns.

This chapter will provide an in-depth analysis of the landscape of the Jianghan Plain during the Neolithic period. It will examine the characteristics of the fields through a comprehensive assessment of soil, water quality, rice paddies, other edible plants, and field patterns. Additionally, the chapter will trace the development and transformation of settlements over time, analysing principles guiding settlement choices, settlement patterns, collective settlements exemplified by the Zhaomaling site (走马岭遗址), residential architecture within settlements and large ancient cities illustrated by the Shijiahe ancient city.

Early Agricultural Landscape

During the Neolithic period, the introduction of agriculture was a significant driver of landscape transformation. Around 6500 BCE, people in southern China began cultivating selectively chosen rice seeds in riverine wetlands.[108] This region, characterized by fertile soil, ample moisture, warm sunlight and distinct seasonal climate variations, provided an ideal environment for rice-based agricultural societies, particularly in the middle Yangtze River region. In the Jianghan Plain area, Neolithic communities initially selected wild rice for cultivation. They likely did not anticipate that their choice would have enduring impacts on contemporary populations. For instance, while wild rice originally grew in a sprawling manner and did not necessarily produce seeds annually, through millennia of selective breeding, it gradually evolved into upright, consistently-maturing rice, eventually becoming rice in its modern form.[109]

The origins of agriculture can be traced back to the era when humans began to experiment with settlement, though they had not yet fully established permanent residences. During this period, people started to create relatively stable living sites but would temporarily vacate them during certain times of the year, such as winter, and return later. The advent of agriculture, however, fundamentally resolved the concerns associated with settlement, as people began to place their trust in the potential of the land. The emergence of primitive agriculture marked a transition from the hunter-gatherer era to a period of production, enabling early societies to rely on sedentary lifestyles rather than migration for food acquisition. This shift allowed people to settle in one place for extended periods and foster population growth. During the Neolithic

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[108] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 134-135. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 134-135.

[109] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 134. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 134.

era, individuals actively modified their surrounding environment, gradually moving from mere adaptation to creating more favourable living conditions. This process, however, inevitably had a profound impact on the original natural landscape.

The Jianghan Plain, as one of the significant birthplaces of ancient Chinese civilization, exhibited relatively advanced agricultural production during the Neolithic period. Understanding the agricultural developments of this era is crucial for studying the evolution of ancient agriculture and the interplay between humans and their environment. This chapter will provide a comprehensive analysis of the initial appearance and evolving field patterns of Neolithic agricultural landscapes in the Jianghan Plain, focusing on aspects such as soil and water quality, rice paddies, edible plants, and field patterns.

Soil and water quality

Since the introduction of agriculture in the Neolithic era, humanity has exerted an increasingly powerful influence over the surface details of the land. While humans strive to modify the land to better suit their survival needs, it is important to recognize that even in today's advanced technological era, human activity only affects the rate of geological changes rather than their direction. Consequently, selecting a natural environment conducive to crop growth and choosing appropriate crop species has posed a significant challenge for the early inhabitants of the Jianghan Plain. The development of agriculture depends on soil and water resources, and the characteristics of the soil and water in the Jianghan Plain have made it one of the key regions for rice cultivation in China since the Neolithic period.

The Jianghan Plain, an alluvial plain formed by the combined sedimentary action of the

Yangtze and Han Rivers, primarily consists of sedimentary strata including sandy clay, clayey sand, sand, and gravel (Figure 22). This long-term sedimentation has resulted in highly fertile soils enriched with organic matter and essential nutrients, creating optimal natural conditions for rice cultivation. According to the *Hubei Provincial Gazetteer*, the predominant soil type in the Jianghan Plain is paddy soil, characterized by a pH range of 5.5 to 8.3 and an average organic matter content of 25.8 g/kg. These factors are highly favourable for rice growth. [110]

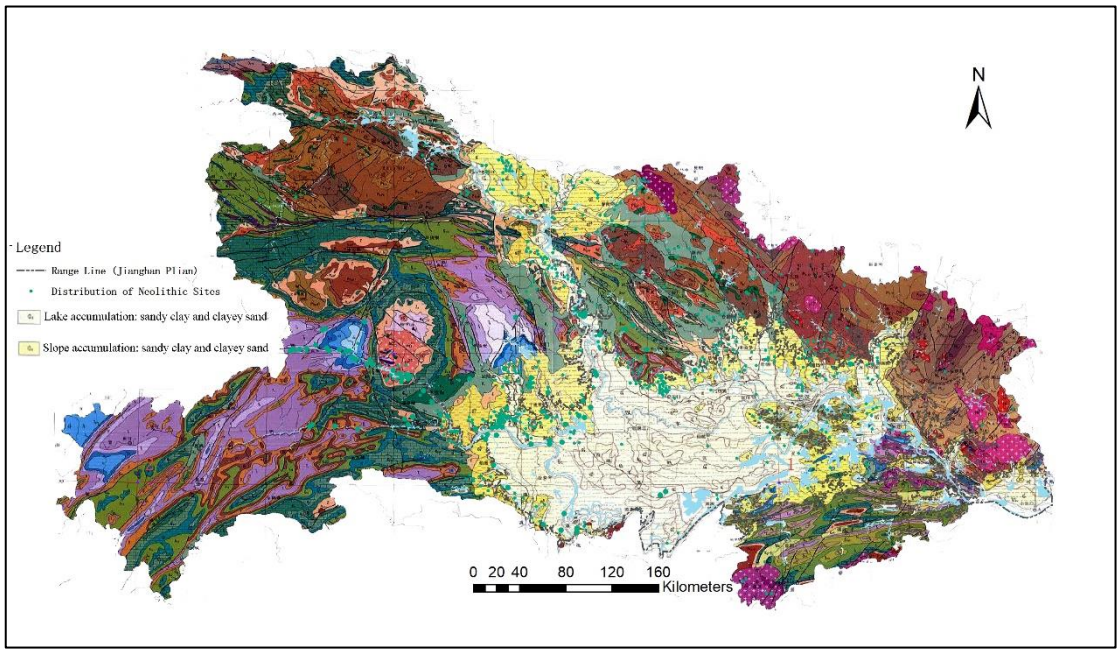


Figure 22. Geological Map of Hubei Province （Source: recreated by the author, based on ‘中国国家文物局主编，《中国文物地图集（湖北分册）》，（西安：西安地图出版社，2002），页 34 / Edited by the National Cultural Heritage Administration of China, Cultural Relics Atlas of China (Hubei Volume), (Xi’an: Xi’an Map Press, 2002）, p. 34)

As a low-lying plain, the natural topography of the Jianghan Plain facilitates the easy flow of moisture. These natural irrigation conditions are highly advantageous for the cultivation and growth of rice. The Yangtze and Han Rivers, among others, provide ample water resources to the region. The pH of the river water here typically ranges from 7.0 to 8.5, indicating a weakly alkaline environment that is suitable for rice

[110] 湖北省地方志编纂委员会，*《湖北省志. 自然综述》*，（武汉：湖北人民出版社, 2020），页 218. / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province - Natural Review,* (Wuhan: Hubei People’ Press, 1994), p. 218.

cultivation. [111] It is noteworthy that in areas less affected by human activities, the dissolved solids content in the river water tends to be higher while the oxygen-demanding substances are lower. [112] Consequently, it can be inferred that during the Neolithic period, the oxygen content of the river water in this region was likely higher than it is today.

Considering the soil characteristics and water quality of the Jianghan Plain, alongside the climatic factors previously discussed, the interplay of these natural elements has laid the foundation for the emergence of agricultural civilization in the Jianghan Plain during the Neolithic era. Consequently, this region has remained an ideal area for rice cultivation from the Neolithic period to the present day.

Paddy field

The history of human cultivated rice can be traced back to the early Neolithic period. Archaeological evidence clearly indicates that the origin of rice is located in the Yangtze River basin in southern China, from where it subsequently spread to northern China, Southeast Asia, and other regions. [113] The Pengtoushan site (彭头山遗址), situated near the Jianghan Plain, has been identified by some scholars as one of the significant locations for the emergence of cultivated rice, representing one of the earliest rice farming communities. [114] Archaeologists speculate that the early inhabitants of the

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[111] 湖北省地方志编纂委员会，*《湖北省志.自然综述》*,(武汉:湖北人民出版社,2020)，页 216. / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province - Natural Review,* (Wuhan: Hubei People' Press, 1994), p. 216.

[112] 湖北省地方志编纂委员会，*《湖北省志. 自然综述》*，(武汉:湖北人民出版社, 2020)，页 216. / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province - Natural Review,* (Wuhan: Hubei People' Press, 1994), p. 216.

[113] Smith, B. D. *The Emergence of Agriculture*, (New York: Scientific American Liry, 1995).

[114] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 132. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 132.

Jianghan Plain were directly influenced by the Pengtoushan site in their rice cultivation practices, which contributed to advancements in agricultural techniques within the Neolithic research area. [115] This aligns with the widely accepted academic conclusion that early agricultural societies primarily established their farming activities in flat areas and supports the hypothesis that rice agriculture originated in the Yangtze River basin, particularly in the middle and lower reaches of the Yangtze River.[116]



Figure 23. Charred rice dating back to the Neolithic era has been unearthed at the archaeological site of Yejiamiao (Source: 吴传仁, 刘辉, 赵志军, <从孝感叶家庙遗址浮选结果谈江汉平原史前农业>, *《南方文物》*, 4（2010），页 65-69 / Chuanren Wu, Hui Liu, Zhijun Zhao, 'Discussing Prehistoric Agriculture in the Jianghan Plain Based on the Flotation Results from the Yejia Temple Site in Xiaogan', *Cultural Relics in Southern China*, 4 (2010), pp. 65-69.)

Although no Neolithic agricultural sites have been discovered in the Jianghan Plain to date, certain in sites, such as the Yejiamiao site（叶家庙遗址）in Xiaogan, have revealed a significant proportion of carbonized rice grains and carbonized rice grain bases among the excavated materials. This evidence suggests that rice paddy cultivation began in this region as early as the Neolithic period. [117] In the flotation experiments conducted at the Yejiamiao site in Xiaogan, researchers identified a substantial quantity of charred plant remains, including both rice and millet. In contrast, the number of other identifiable plant seeds was relatively low (Figure 23). Analysis of the non-crop plant remains revealed the presence of various weed species commonly

[115] 何介钧,安田喜宪，*《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*，(北京:文物出版社,2017), 页 6. / Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain)*, (Beijing: Cutural Relice Publishing House, 2017), p. 6.

[116] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 151. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 151.

[117] 张兰生，方修琦，*《中国古地理》*，（北京：科学出版社，2005），页 126-129. / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), pp. 126-129.

found in modern agricultural fields. This observation suggests that the Yejiamiao site during the Neolithic period possessed an environment conducive to agriculture and farming.[118] It can be inferred that rice cultivation was already present in the Jianghan Plain during this era.

Moreover, the rice remains found at the Qujialing site (屈家岭遗址) represent one of the earliest known examples of prehistoric rice cultivation in the Jianghan Plain. Archaeologists have uncovered a substantial quantity of charred rice grains within the red-burnt soil. Soil samples were subjected to flotation analysis, which clearly indicated that the primary charred remains of edible plants found were rice and rice husks (Figure 24). Notably, the flotation results revealed that rice remains and rice husks not only predominated in quantity but were also almost equal in number, suggesting a close association between the two types of charred remains. This correlation provides a significant basis for determining whether artificial rice cultivation had already begun at that time. [119] This finding confirms that the Qujialing site, dating to the Neolithic era, was characterized by a rice-based agricultural

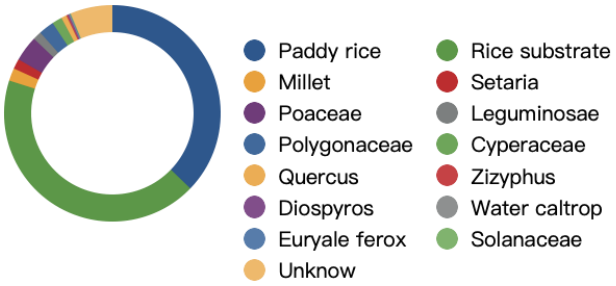


Figure 24. The Flotation Process of Carbonized Plant Remains at the Qujialing Site (Source: created by the author, based on 'Muslim Khan, Ling Yao, Yuzhang Yang, Yang Tao, Weiya Li, Dewei Zhang, Yunbing Luo, Juzhong Zhang, 'Plant foods consumed at the Neolithic site of Qujialing (ca.5800-4200 BP) in Jianghan Plian of the middle catchment of Yangtze River, China', *Plant Systematics and Evolution*, 13 (2022.)

[118] 丁颖, <江汉平原新石器时代红烧土中的稻谷壳考查>, 《考古学报》,4（1959），页 31-34. / Ying Ding, 'Examination of Rice Husk in Neolithic Red Burnt Clay from the Jianghan Plain', *Acta Archaeologica Sinica*, 4 (1959), pp. 31-34.

[119] 郑云飞，孙国平，陈旭高,<7000 年前考古遗址出土稻谷的小穗轴特征>,《科技通报》,9（2007），页 1037-1041. / Feiyun Zheng, Guoping Sun, Xugao Chen, 'Characteristics of the small spikelets of rice grains found at an archaeological site dating back 7,000 years', *Bulletin of Science and Technology,* 9 (2007), pp. 1037-1041.

civilization.

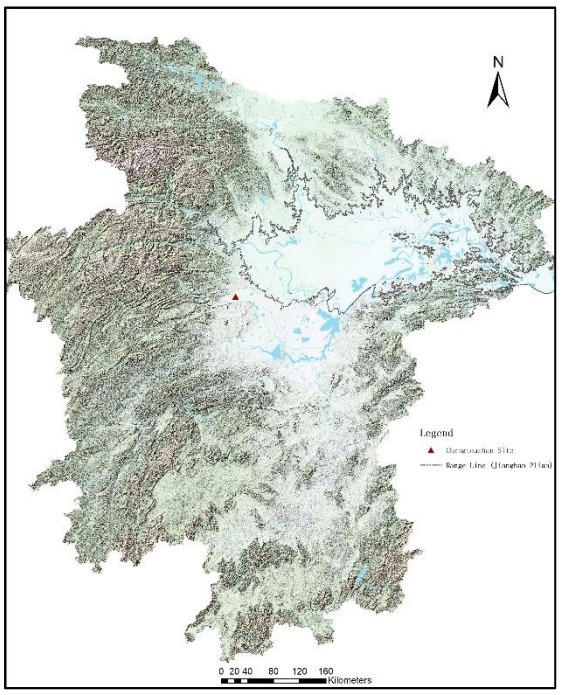


Figure 25. Location of Chengtoushan site (Source: created by the author)

While it can be inferred that the agricultural areas were generally located within the settlement sites, [120] more detailed elements of the agricultural landscape are not adequately reflected in the archaeological record. But fortunately, archaeologists have uncovered Neolithic rice paddy remains at the Chengtoushan site (城头山遗址), which is situated only 100 kilometres in a straight line from the Jianghan Plain (Figure 25). This site is located in the Liyang Plain, which, like the Jianghan Plain, lies in the middle reaches of the Yangtze River. Geographically, the Liyang Plain is connected to the Jianghan Plain through waterways, particularly via the connection between the Li River and the Yangtze River. This geographic advantage facilitated the potential diffusion of agricultural technologies and cultural practices to the Jianghan Plain. According to archaeological research, most scholars believe that the Neolithic culture of Hubei was influenced by the contemporary cultural groups in the Liyang Plain, then gradually developing its own distinct style. [121] Additionally, studies of rice remain have shown that, under changes in Earth's latitude, rice remains in higher latitude regions are found later; conversely, in lower latitudes, rice remains are found earlier. This pattern indicates that rice cultivation spread from south to north. Thus, the viable transmission path related to the Yangtze River's middle reaches appears to be

[120] 孟华平，向其芳,*《湖北史前城址》*,（北京：科学出版社，2015），页 94 / Huaping Meng, Qifang Xiang, *Prehistoric City Sites in Hubei,* (Beijing: Science Press, 2015), p. 94.

[121] 于淼，*《长江中游的史前时代》*,（武汉：武汉大学出版社，2020），页 151 / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 151.

from the Liyang Plain to the Jianghan Plain. Based on the above analysis, the relationship between the Chengtoushan site and contemporaneous sites in the Jianghan Plain can be summarized as follows: 1) Similar geomorphological features, both located on alluvial plains formed by the Yangtze River and its tributaries; 2) The region of the Chengtoushan site and the Jianghan Plain may have had cultural and technological connections during the prehistoric period due to their unique geographic positioning; 3) The trajectory of rice agriculture's dissemination. Therefore, it is inferred that the characteristics of the rice paddy remains at the Chengtoushan site may, to some extent, reflect the features of prehistoric rice paddies in the Jianghan Plain.

The rice paddies at the Chengtoushan site exhibit careful planning and design (Figure 26). The sacrificial platform located in the southwestern part of the paddies indicates a close connection between rice cultivation and ritual practices, suggesting that agricultural ceremonies to pray for a bountiful harvest may have been conducted there. [122]

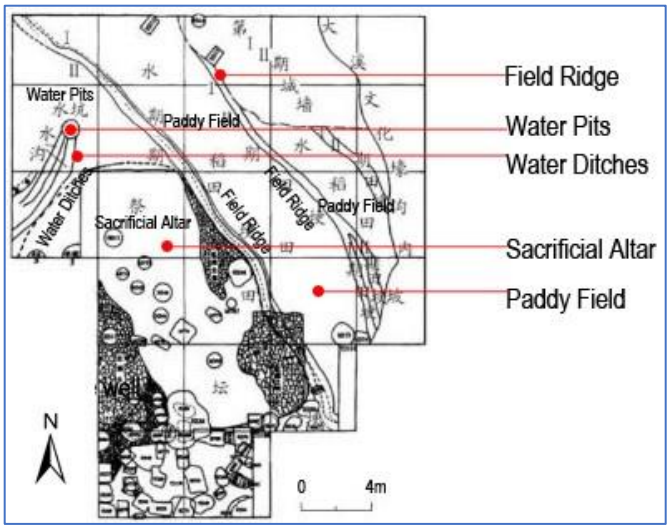


Figure 26. Plan of Neolithic Rice Paddy Ruins (Source: 何介钧, 安田喜宪, *《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*, (北京:文物出版社, 2017), 页 166. / Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain*), (Beijing: Cutural Relice Publishing House, 2017), p. 166.)

Archaeological excavations reveal three parallel ridges extending from west to east, with uniform spacing between them. In contemporary rice paddies, such ridges are essential for guiding and distributing water flow, ensuring that each plot receives adequate moisture. This not only aids in maintaining field moisture and preventing soil

[122] 何介钧, 安田喜宪, *《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*, (北京:文物出版社, 2017), 页 164-165. / Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain)*, (Beijing: Cutural Relice Publishing House, 2017), pp. 164-165.

erosion but also facilitates movement and work within the fields. Additionally, archaeologists have identified an associated primitive irrigation system comprising two ditches and three water pits, all situated on elevated land to the west of the paddies. [123] This infrastructure demonstrates the ingenuity of the ancient inhabitants, who designed the irrigation system to utilize the land's elevation differences. Water was collected in the pits from natural sources and then distributed via the ditches to sustain the moist conditions necessary for rice cultivation (Figure 27).



Figure 27. Ancient paddy field and field ridge (Source: 何介钧, 安田喜宪，*《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*，（北京：文物出版社, 2017）/ Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain),* (Beijing: Cutural Relice Publishing House, 2017))



Figure 28. Aerial Photograph of the Maoshan archaeological site (Source: Pin Ding, Yunfei Zheng, Xugao Chen, Shaobin Zhong and Ningyuan Wang, 'Linping Maoshan Site, Yuhang, Zhejiang', *China Heritage Daily*, 3 (2010), p. 4.)

[123] 何介钧, 安田喜宪，*《澧县城头山-中日合作澧阳平原环境考古与有关综合研究》*，（北京：文物出版社, 2017），页 165. / Jiejun He, Yasuad Yoshinori, *Chengtoushan in Lixian (Sino – Japan Cooperative Research on Environmental Archaeology in the Liyang Plain)*, (Beijing: Cutural Relice Publishing House, 2017), p. 165.

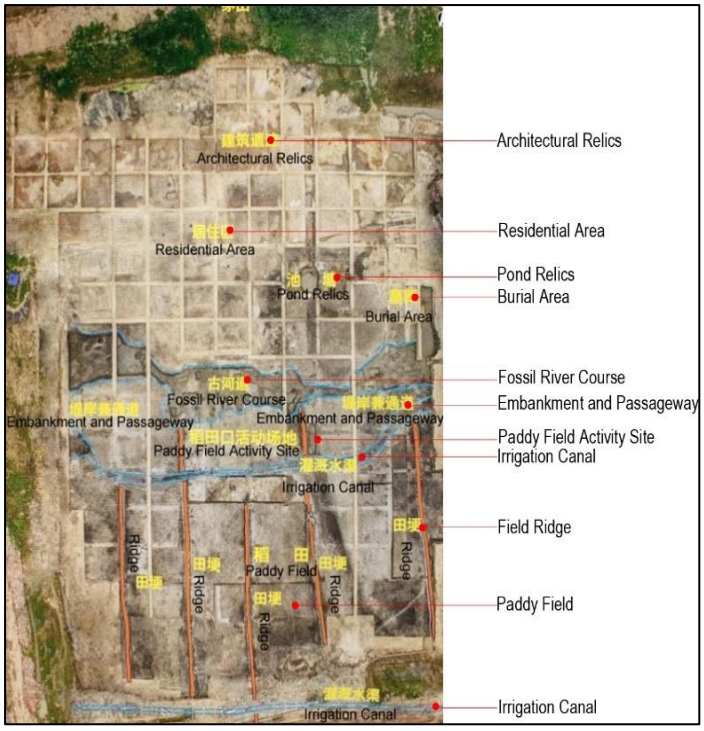


Figure 29. An aerial depiction of the remnants of rice fields found at the Maoshan archaeological site (Source: recreated by the author, based on '赵晔，〈浙江余杭临平遗址群的聚落考察〉，*《东南文化》*，3（2012），页 31–39，（第 33 页）. / Ye Zhao, 'Investigations on the Archaeological Ensemble of Heritage Sites at Linping,Yuhang', *Southeast Culture*, 3 (2012), pp. 33-34, (p. 33)'.)

In addition, the patterns of Neolithic paddy fields in Jianghan Plain can be also inferred from the Maoshan site (茅山遗址) in Hangzhou. This site, associated with the Liangzhu Culture of the Neolithic period. It shares geographical and ecological similarities with the Yangtze River midstream area. The early Neolithic inhabitants of this region were primarily engaged in rice farming. The prehistoric settlement pattern at the Maoshang site can be divided into two sections based on the terrain. The northern area, which is at a higher elevation, served as the residential zone, including burial sites. The southern, lower-lying area was used for cultivating rice paddies (Figure 28). [124] According to archaeological reports, the agricultural remains in the paddies are densely arranged in rectangular plots.[125] Archaeologists have discovered east-west flowing rivers, canals, and raised fields made of red-burnt earth in the ancient farmland area (Figure 29). Photos from field excavation reports show that the fields are divided into several

[124] 郑云飞，陈旭高，丁品，〈浙江余杭茅山遗址古稻田耕作遗迹研究〉，*《第四纪研究》*，1（2014），页 85–89. / Yunfei Zheng, Xugao Chen, Pin Ding, 'Studies on the Archaeological Paddy Fields at Maoshan Site in Zhejiang', *Quaternary Sciences*, 1 (2014), pp. 85-89.

[125] 赵晔，〈浙江余杭临平遗址群的聚落考察〉，*《东南文化》*，3（2012），页 31–39. / Ye Zhao, 'Investigations on the Archaeological Ensemble of Heritage Sites at Linping,Yuhang', *Southeast Culture*, 3 (2012), pp. 31-39.

sections by embankments, forming a rectangular pattern.[126] Irrigation channels run along both sides of the rice paddies; these channels are connected to ancient riverbeds and to each section of the fields, creating a cyclical irrigation system. Additionally, there are man-made embankments and a communal area between the irrigation channels and ancient riverbeds. This design may have been intended both to protect the rice paddies from flood damage and to provide a space for farmers to perform agricultural rituals, possibly to ensure good harvests each year.

Ying Ding, a pioneer in modern rice science and an academician of the Chinese Academy of Sciences, provided a conclusive identification in his research paper. He clarified that these rice varieties are Japonica rice and show a high degree of similarity to the varieties currently being cultivated.[127] Based on this conclusion, one might wonder: what similarities exist between Neolithic rice paddies and today's rice fields?

Looking across the entire Jianghan Plain, although new rice paddy remains from the Neolithic era have not yet been discovered in this region for various reasons, some general inferences can be made based on existing site conditions. The Shijiahe site (石家河遗址), the largest ancient city in the Jianghan Plain, has been a focal point of archaeological excavation in recent years. Based on the current archaeological data and geomorphological features of the Shijiahe site, archaeologists can roughly infer that the flat and open areas at elevations between 30 and 40 metres in the eastern and northeastern parts of the site were likely used for agricultural activities by the Shijiahe

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[126] 长江文明馆，*《长江中游地区新石器时代的人地关系研究》*，（武汉：长江出版社，2015），页 89. / The Changjiang Civilization Museum, *A Study on the Relationship Between Man and Land in the Neolithic Age in the Middle Reaches of the Yangtze River*, (Wuhan: Changjiang Press, 2015), p. 89.

[127] 丁颖，〈江汉平原新石器时代红烧土中的稻谷壳考查〉，*《考古学报》*，4（1959），页 31-34. / Ying Ding, 'Examination of Rice Husk in Neolithic Red Burnt Clay from the Jianghan Plain', *Acta Archaeologica Sinica*, 4 (1959), pp. 31-34.

people, making them ideal for rice cultivation.[128] Additionally, it is inferred that rice cultivation occurred in the low-lying areas adjacent to natural rivers on the southwestern side of the site. This would have effectively utilized the water resources from the natural river channels and the fertile soil along the riverbanks, while also taking advantage of the West City Moat as a water storage facility to ensure a reliable water supply during dry periods, supporting rice growth.[129] Based on the analysis of the two-rice paddy remains mentioned above and the current appearance of rice paddies in the Jianghan Plain, this chapter speculates on the possible original appearance of rice paddies in the Jianghan Plain during the Neolithic era (Figure 30).

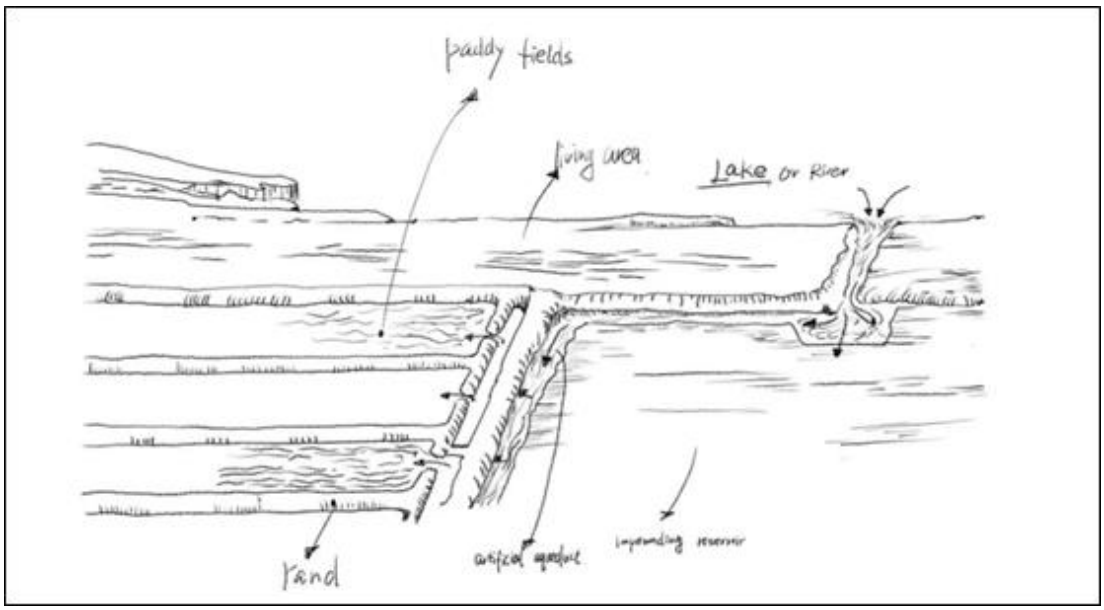


Figure 30. Speculating the Neolithic Rice Field System in the Jianghan Plain: A Reconstruction. (Source: created by the author, based on 方勤,赵阳,李瑞,王琢玺,钟倩,朱世乾,咎存宝,李晓杨,杨宇阳，<天门石家河城址及水利系统的考古收获>,《江汉考古》,（01）2023，页 19-35. / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system', *Jianghan Archaeology*, (01) 2023, pp. 19-35.)

[128]北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，《南方民族考古》，（00）1993，页 213-294. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.

[129] 方勤, 赵阳, 李瑞, 王琢玺, 钟倩, 朱世乾, 咎存宝, 李晓杨, 杨宇阳，<天门石家河城址及水利系统的考古收获>,《江汉考古》,（01）2023，页 19-35. / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system', *Jianghan Archaeology*, (01) 2023, pp. 19-35.

In summary, this chapter infers that the rice fields in the Jianghan Plain during the Neolithic era had the following four notable features:

1. The rice fields had primitive irrigation systems thanks to the early irrigation and hydraulic technologies developed by humans at that time. They used natural water sources and artificial channels to irrigate the fields to meet the water needs of rice. Additionally, they constructed pits and ponds to store water resources.

2. Field ridges, which served as physical barriers between different plots, were present in every rice field. These ridges helped retain moisture in the fields, prevent soil erosion, and facilitated movement and work within the fields.

3. Rice fields were generally located in extensive areas near natural water sources, with an elevation variation usually within five metres, resulting in gently sloping flat terrain.

4. There were typically sacrificial sites near the rice fields, usually large open platforms. These sacrificial rituals were likely intended to pray for abundant harvests, good weather, and community prosperity. It is noteworthy that the ancestors in the middle Yangtze region had a strong belief in deities during ancient times. Archaeologists have discovered the ‘Sun Man’ stone carvings in Zigui County, on the edge of the Jianghan Plain, near the Yangtze River. These carvings, dating back to around 5000 BCE from the Chengbeixi Culture period, exhibit strong primitive religious elements and various social functions (Figure 31). The ‘Sun Man’ carvings represent relics of sun worship practices and are believed to symbolize a strong desire to understand the mysteries behind the sun, possibly related to agricultural activities.



Figure 31. Sun Man Stone Carving (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 163. / Miao Yu, Prehistoric times in the middle reaches of the Yangtze River, (Wuhan: Wuhan University Press, 2020), p. 163.)

Other edible plants

In addition to rice, various other edible plants may have also grown in the fields. Millet cultivation, likely spread southward from the Central Plains through the Han River, arriving in the Jianghan Plain later than rice. During the Neolithic period, the Jianghan Plain was still in the flourishing phase of the Yunmengze Lake Cluster, with abundant water resources and moist soil providing an excellent natural environment for rice cultivation. As a result, rice agriculture dominated the Neolithic Jianghan Plain. Additionally, some archaeologists have discovered charred millet at several sites, further indicating that millet, originating from the middle and lower reaches of the Yellow River, played a supplementary role in Neolithic agriculture in the Jianghan Plain. However, since millet cultivation often requires loose, well-drained soil, hilly and mountainous areas are generally the best choice. Therefore, the Jianghan Plain was not suitable for large-scale millet cultivation, and millet served more as a supplementary

resource in the daily lives of people at that time.

Currently, archaeologists have completed plant flotation studies at several Neolithic sites in the Jianghan Plain region and have published their findings. Muslim Khan and colleagues conducted sedimentation experiments at the Neolithic Qujialing site (屈家岭遗址). They analysed starch extracted from pottery shards and found evidence of plant foods including rice, millet, acorns (oak), lotus root, persimmon, water chestnut, Chinese yam, soybean, plum, barley and yam.[130] These findings not only demonstrate the dietary diversity of the Qujialing settlement during the middle Neolithic period but also enhance our understanding of food categories in primitive societies.

Additionally, the Tanjialing site (谭家岭遗址), located in the core area of the Shijiahe site cluster, is one of the oldest sites in the cluster, with a history dating back to the Daxi culture period.[131] Archaeologists conducted excavations with cross-sections in both the Tanjialing and Sanfangwan sites (三房湾遗址), which are part of the Shijiahe site cluster. They sent soil samples collected from these two areas to the laboratory for flotation extraction to obtain palynomorphs. After floating the plant remains, they can be roughly categorized into three types: 1. Cereal plants; 2. Weeds; 3. Wild edible plants.[132] Cereal remains include rice and millet, which make up a significant proportion of the flotation total, about 42%. Wild edible plants include many edible plants remains, but their proportion is relatively low, around 20% of the total. Weed plant remains are the second largest category, accounting for about 38% of the total

[130] Muslim Khan, Ling Yao, Yuzhang Yang, Yang Tao, Weiya Li, Dewei Zhang, Yunbing Luo, Juzhong Zhang. 'Plant foods consumed at the Neolithic site of Qujialing (ca.5800-4200 BP) in Jianghan Plian of the middle catchment of Yangtze River', *China. Plant Systematics and Evolution*, 13 (2022).

[131] 于淼，《长江中游的史前时代》，（武汉：武汉大学出版社，2020），页 283. / Miao Yu, Prehistoric times in the middle reaches of the Yangtze River, (Wuhan: Wuhan University Press, 2020), p. 283.

[132] 邓振华，刘辉，孟华平.<湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析>，*《考古》*，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, *Archaeology*, (01) 2013, pp. 91-99

(Figure 32).

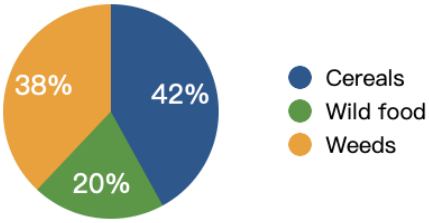


Figure 32. Flotation process applied to charred botanical remains discovered at the Shijiahe Site Cluster. (Source: created by the author, based on '邓振华，刘辉，孟华平. <湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析>，《*考古*》，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, Archaeology, (01) 2013, pp. 91-99.)

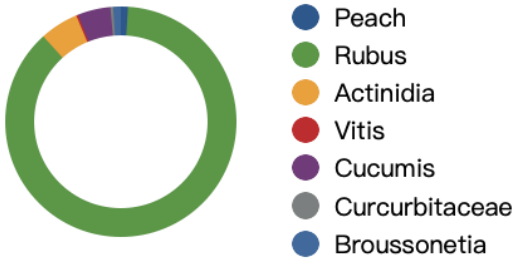


Figure 33. Floatation process for carbonized edible remains of wild plants at the Shijiahe archaeological site (Source: created by the author, based on 邓振华，刘辉，孟华平. <湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析>，《*考古*》，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, *Archaeology,* (01) 2013, pp. 91-99.)

Among the plant remains of wild food species (Figure 33), the quantity of remains from the genus 'Rubus' is the most significant. This suggests that in the Neolithic Shijiahe site group, 'Rubus' plants were likely a frequently used or closely related plant resource for daily activities. 'Rubus' plants are shrubs that retain their green leaves for long periods and are widely distributed in plains, hilly, and mountainous areas. Currently, Hubei Province has over 50 species of 'Rubus', many of which produce fruits rich in pulp with a taste that is both tart and sweet. These fruits can be consumed directly or used to make wine and preserves. The Jianghan Plain, a sedimentary plain with thick, organic-rich soil, provides an ideal environment for 'Rubus' plants to obtain sufficient nutrients and water. Thus, it is hypothesized that the fruits of 'Rubus' plants were likely one of the main wild food sources for Neolithic inhabitants around the Shijiahe site and in many areas of the Jianghan Plain. In addition to 'Rubus', other edible wild plants discovered at the Shijiahe site include 'Euryale', peaches, grapes, 'Coriaria', melons and kiwis.

Additionally, an analysis of the plant distribution in the Jianghan Plain reveals that most edible wild plants, except for kiwi, and plum, are well-suited to the region. These fruits thrive best on slopes and mountainous areas. In Hubei Province, the primary production areas for persimmon, kiwi and plum are located in the hilly regions on the southern slopes of the Dabie Mountains, the transition zones from the western mountainous regions of Hubei to the Jianghan Plain, and the core areas of the Qinba Mountains. Therefore it is likely that the activities of the inhabitants of the Shijiahe site during the Neolithic period were not confined to the plain areas but also extended to the nearby mountainous regions for gathering and hunting, which is consistent with the speculation of Deng and others in their papers.[133] This article suggests that, as human techniques for domesticating wild plants advanced, early settlers might not only have cultivated rice and millet near their settlements but also brought back seeds of fruits and vegetables from the wild, and then engaged in limited sowing around their living areas, such as planting citrus trees (Figure 34).

[133] 邓振华，刘辉，孟华平.<湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析>,《考古》,（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, *Archaeology*, (01) 2013, pp. 91-99.



Figure 34. The present study focuses on the reconstruction of the Neolithic Age's human habitation environment in the Jianghan Plain (Source: created by the author, based on 邓振华，刘辉，孟华平.〈湖北天门市石家河古城三房湾和谭家岭遗址出土植物遗存分析〉，*《考古》*，（01）2013，页 91-99. / Zhenhua Deng, Hui Liu, Huaping Meng, Analysis of Plant Remains from the Shijiahe Ancient City Sites at Sanfangwan and Tanjialing in Tianmen, Hubei, *Archaeology*, (01) 2013, pp. 91-99)

During the Neolithic period, the inhabitants of the Jianghan Plain relied not only on crops like rice and millet for food but also gathered a variety of edible plant resources such as nuts, legumes and various fruits. Rice was their primary crop, while millet served as a supplementary crop, with the remains of rice being found in much greater quantities than millet. These plants enriched their food sources and reflected the diverse agricultural practices of the time.

Field pattern

The settlement sites mentioned earlier include ancient city ruins and large central settlement sites. Although agricultural remains have not yet been discovered at these sites or in the entire Jianghan Plain region, research on agricultural societies suggests that the maximum activity radius for agricultural production is approximately one-hour’s walking distance from the settlement.[134] Based on the normal walking speed of young people, it can be inferred that there

[134] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294，（第 282 页） / A Joint Archaeology Team of Department of Archaeology,

might be agricultural areas associated with or under the jurisdiction of these settlements within a radius of about 5000-6000 metres around the settlement sites.

Using ArcMap software, the geomorphological map of Hubei Province was overlaid with the coordinates of 26 newly discovered Neolithic site locations and central settlement sites in Hubei Province, resulting in a distribution map of the sites (Figure 35). Observations reveal that many small, dispersed settlements or villages cluster around these large central settlement sites. Combining this with flotation results of carbonized plant remains suggests that during the Neolithic period, agricultural landscapes in the Jianghan Plain region were primarily situated between urban and rural areas. The outskirts around these central settlements were rural, while areas farther from the suburbs appeared relatively desolate, and more distant regions were characterized by wilderness and forested areas. This varied distribution pattern indicates a diverse Neolithic landscape.

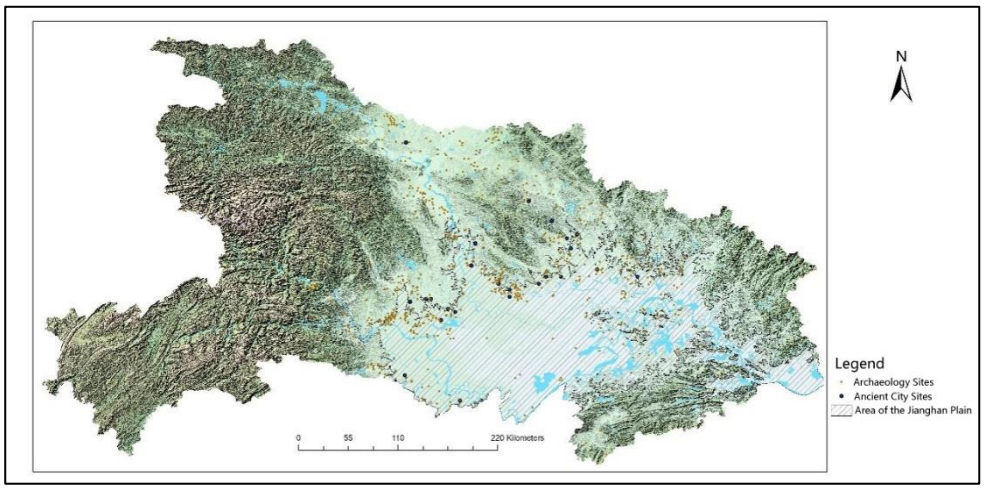


Figure 35. Distribution of Neolithic Ancient City Sites in Hubei Province (Source: created by the author)

Based on the previous discussion, this chapter focuses on central settlements and divides the Neolithic landscape of the Jianghan Plain into suburban, rural, and

Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294, (p. 282).

mountainous areas for easier analysis. The results are as follows:

1. Suburban Areas: Within a 5000–6000-metre radius around central settlements, there are various sizes of areas of farmland. These fields have been developed into large agricultural zones primarily for rice cultivation, with dry crops like millet as a secondary crop. These farmlands are typically located in flat, open areas with ample water sources, consistent with the findings in the *An Investigation Report on Shijiahe Sites* by the Shijiahe archaeological team.

2. Rural Areas: In these zones, farmland is usually scattered rather than continuous. Various small, dispersed villages are found around the farmlands. These villages are relatively distant from central settlements and are more self-sufficient. The sparsity of settlements in rural areas increases with distance from central settlements, and farmland becomes increasingly dispersed. Like suburban areas, rice paddies dominate, with dry crops as a secondary focus. However, in rural areas, farmlands are typically closer to residential homes, and rice paddies are usually situated at lower elevations than the surrounding residential areas.

3. Mountainous Areas: During the Neolithic period, these areas were largely untouched due to their vastness, low population density, and primitive agricultural techniques. Despite this, the region was rich in plant resources, providing residents with food, fuel, and building materials. In the Jianghan Plain region, Neolithic residents' activity extended into the nearby mountainous areas.

This pattern-based speculation and inductive summary are based on the results of relevant archaeological excavation reports and historical geography research. However, actual conditions may vary due to regional differences, settlement influences, and other multifaceted factors. In the Jianghan Plain, the landscape of Neolithic settlements might exhibit more unique and diverse characteristics.

During the Neolithic period, the agricultural landscape of the Jianghan Plain likely exhibited a blend of natural and human-made features. From the suburbs around settlement sites to rural areas and forested regions, humans adapted to and altered nature through continuous exploration. Some areas focused on cultivating staple crops like rice, creating relatively orderly fields, while other areas saw a coexistence of wild plants and crops, forming a complex ecological system. This pattern reflects both human use and modification of nature, while also preserving some degree of ecological balance. The landscape, dominated by rice paddies with supplementary millet fields, combined with other edible plants, created a distinctive terrestrial landscape in the Neolithic Jianghan Plain.

Settlement of Ancient Ancestors

What changes does settled life bring? In the past, when groups were constantly on the move, the survival rate of vulnerable infants and young children was lower, and they were a burden on the journey due to their slow mobility, so people intentionally controlled reproduction. However, once life became stable, fertility rates noticeably increased. The growth in population represented an increase in labour, which allowed for more refined division of labour and collaboration. A primitive settlement based on kinship gradually formed. Settlements are the tangible manifestation of human habitation on the surface of the Earth. [135] French geographer Albert Demangeon once said that in the early stages of primitive societies, people instinctively sought to live together for shared defence and subsistence, which led to the formation of various types

[135] 长江文明馆，*《长江中游地区新石器时代的人地关系研究》*，（武汉：长江出版社，2015），页 135. / The Changjiang Civilization Museum, *A Study on the Relationship Between Man and Land in the Neolithic Age in the Middle Reaches of the Yangtze River*, (Wuhan: Changjiang Press, 2015), p. 135.

and scales of settlements. [136]

Many Neolithic sites in the Jianghan Plain have now been confirmed through archaeological work, providing valuable historical evidence for studying early human settlements. Field surveys reveal that many former villages and ancient cities are now largely covered by crops. This phenomenon suggests that human choices about their living arrangements and locations are constantly changing, influenced by factors such as the natural environment, resource distribution, and warfare. As Michael noted, in certain historical periods, roughly the same group of people would use the same local landscape to meet their long-term survival needs, but their descendants might live in different places at different times. [137]

Site section

In ancient times, humans were often forced to migrate over long distances in search of liveable environments. The end of the Palaeolithic era saw a rise in temperatures, which led to a dramatic increase in precipitation on the Jianghan Plain. [138] At this time, rising sea levels slowed the gradient of the Yangtze River's middle and lower reaches, causing sediment accumulation that affected the Jianghan Plain. The plain had not yet developed extensive lakes, meaning it lacked flood resistance, and there was a risk of land being submerged when river waters rose. [139] As a result, the Jianghan Plain was consistently threatened by floods, making it an unsuitable environment for early

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[136] Albert Demangeon, *The Problems of Human Geography*, (Beijing: The Commercial Press, 1993) , p. 157.

[137] Michael Aston, *'Interpreting the Landscape – Landscape Archaeology and Local History'*, (London: Taylor & Francis Group, 1985), pp. 94-95.

[138] 方金琪. 冰后期海面上升对长江中下游影响的探讨. 地理学报，4(1991)，页 427-435. / Jinqi Fang,'A Pilot Study on the Impact of Postglacial Sea Level Rise on the Middle and Lower Reaches of the Changjiang River', *Acta Geographica Sinica*, 4 (1991), pp. 427-435.

[139] 金伯欣，*《江汉湖群综合研究》*，（武汉：湖北科学技术出版社，1992），页 33-34. / Boxin Jin, *Comprehensive Study of the Jianghan Lake Cluster*, (Wuhan: Hubei Science & Technology Press, 1992), pp. 33-34.

humans to settle. It was not until the early Neolithic period, with the emergence of villages, that people began transitioning from a nomadic lifestyle of foraging and hunting to settled living. This marked the beginning of a new phase in human civilization and ended the era of constant migration. By the mid-Neolithic period, during the Daxi culture phase, the formation of the Yunmengze lake cluster within the inland region of the plain helped alleviate flooding along the edges of the Jianghan Plain. [140] Therefore, based on changes in the natural environment, it is unlikely that large-scale settlement sites existed in the Jianghan Plain during the early Neolithic period. People would have preferred to establish their settlements in higher altitude areas. Consequently, it can be inferred that humans began to truly inhabit the Jianghan Plain during the mid-Neolithic Daxi culture period.

To visualize the patterns of settlement site selection by ancient peoples, this chapter uses ArcMap software. It overlays the site data from four Neolithic archaeological cultures (Chengbeixi Culture, Daxi Culture, Qujialing Culture, and Shijiahe Culture) collected from the *Chinese Cultural Relics Atlas: Hubei Volume* onto the DEM (Digital Elevation Model) elevation data map of Hubei Province. The aim is to directly observe and more intuitively identify the distribution characteristics and migration trends of these sites (Figure 36).

[140] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 350-351 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), pp. 350-351.

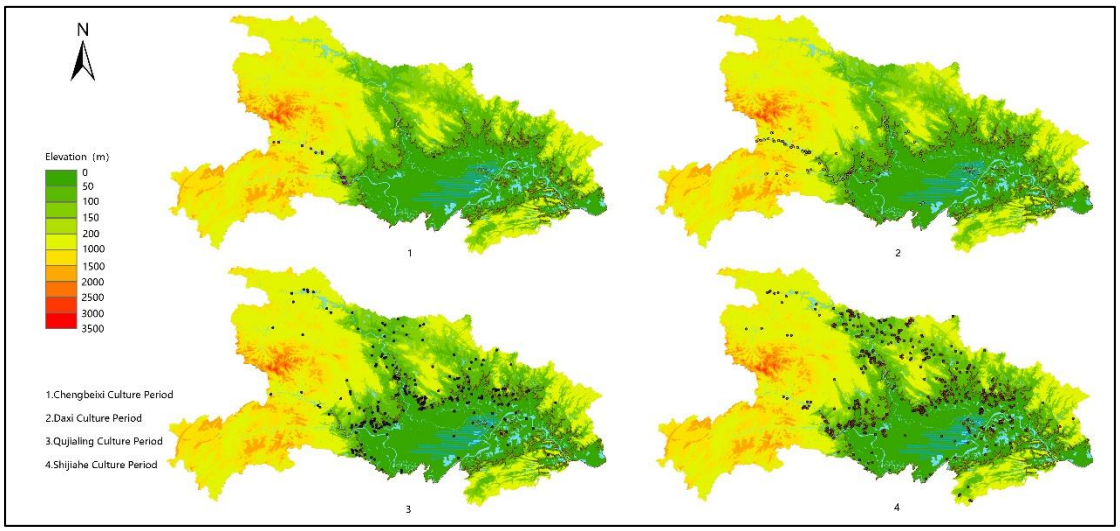


Figure 36. The dispersion pattern of Neolithic settlements within Hubei Province （Source: created by the author, use ArcMap）

By comparing the distribution of sites from the first two archaeological cultural periods, it is found that in the Jianghan Plain, the number of sites from the Daxi Culture period significantly increased compared to the Chengbeixi Culture period. This result supports the hypothesis mentioned earlier. Additionally, when comparing the distribution of sites across all four cultural periods, it is observed that the number of sites in the Jianghan Plain area continuously increased over time, experiencing exponential growth during the Qujialing Culture period and reaching its peak during the Shijiahe Culture period. Looking at the entire Hubei province, the distribution of these sites shows a trend of spreading from the high-altitude western regions to the lower-altitude eastern areas. This indicates that during that era, people in Hubei began to move their living areas from higher altitudes to the lower-altitude Jianghan Plain.

So, what are the reasons behind this migration trend? The analysis in this chapter suggests three main factors:

1. Throughout various periods, humans needed to settle in locations near water sources that could also protect them from floods. The Jianghan Plain, situated at the confluence of the Yangtze and Han rivers, was an ideal choice due to its

abundant water resources. Tribes often settled near rivers and lakes to benefit from both irrigation for crops and a rich supply of fish.

2. Rapid population growth made the hunter-gatherer lifestyle unsustainable, putting increasing pressure on land and eventually exceeding it carrying capacity. In the early Neolithic era, humans had to balance population size with land capacity. Redding proposed two methods to address resource shortages caused by prehistoric population pressures: migrating to new, suitable areas or adopting new technologies to improve food acquisition. Inhabitants of Hubei during the Neolithic era seemed to combine both approaches. [141] They mastered rice cultivation and gradually shifted to rice farming, while also relocating to the Jianghan Plain, which was more suitable for rice cultivation, thus addressing the issue.

3. In the ancient primitive society, people could only move by walking. However, the diverse terrain and rich river system of the Jianghan Plain greatly facilitated travel and improved their lives. Archaeological excavations at the Kuahuqiao site uncovered remains of dugout canoes (Figure 37), indicating that even in the Neolithic era, people used simple canoes or rafts to traverse water bodies. [142] The residents of the Jianghan Plain took full



Figure 37. The archaeological discovery of a fragmented canoe at the Neolithic Kuahuqiao site (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 63. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 63.)

[141] Redding, R. W., 'A general explanation of supplement change: from Hunter - gathering to food production', *Journal of anthropological archaeology*, 7 (1988), pp. 56-97.

[142] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 62-63. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 62-63.

advantage of the well-developed water network, making rivers crucial transportation routes (Figure 38). Settlements were often established in areas with good transportation access, typically close to rivers to ease movement between different regions.

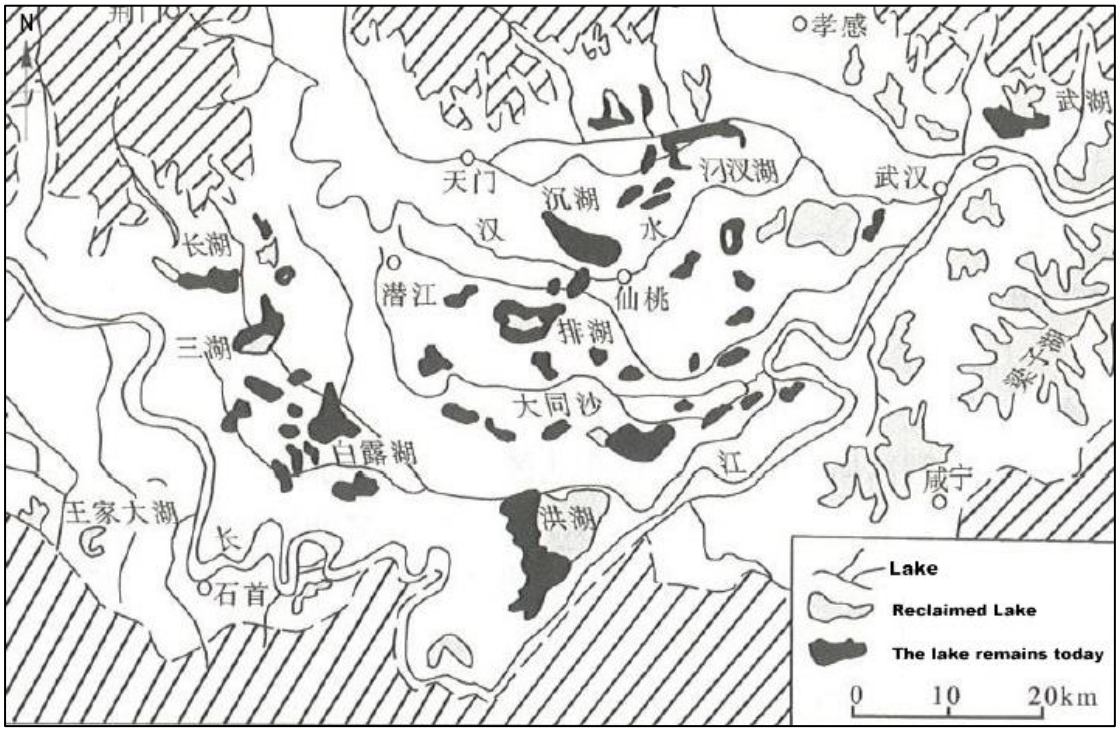


Figure 38. Jianghan Plain lake system (Source: 徐瑞瑚, 谢双玉,赵艳,<江汉平原全新世环境演变与湖群兴衰>，*《地域研究与开发》*，4（1994），页 52-56. / Ruihu Xu, Shuangyu Xie, Yan Zhao, Holocene Environmental Changes and the Dynamics of Lake Systems in the Jianghan Plain, *Areal Research and Development,* 4 (1994), pp. 52-56.)

Building on the aforementioned hypotheses and questions, the following analysis seeks to explore whether it is possible to deduce the site selection criteria and modification principles of our ancestors by examining the material remains they left behind (using specific site examples). In Neolithic settlement site selection, geographic considerations play a crucial role. The process of choosing and developing settlement sites represents humanity's efforts to modify and reshape the natural landscape, thereby creating distinctive cultural landscapes and diverse land-use practices. When a settlement is established at a particular location, subsequent construction activities alter the pre-existing landscape, potentially leading to changes in land use patterns, water

resources, vegetation and the introduction of buildings.

The geographical features of the Jianghan Plain, particularly its elevated hillocks and hydrological environment, have played a crucial role in determining settlement locations and internal structural layouts. The elevated hillock regions provided security for early inhabitants; during flood events, those residing in the plain could utilize the topographical advantages of these elevated areas to migrate through passages connecting different hillocks, thereby maintaining the continuity of their livelihoods and spatial organization. This strategy significantly mitigated the impact of flooding on daily life. The presence of rivers and lakes offered abundant water resources and fertile soil, which not only supported the development of rice agriculture but also provided vital waterways for transportation. This, in turn, facilitated cultural and technological exchanges and accelerated the progress of Neolithic civilization in the Jianghan Plain.

As indicated above, from the Neolithic period onward, settlements began to emerge in the Jianghan Plain region. Over time, the number of settlements in this plain experienced a dramatic increase. The discovery of the Shijiahe site group suggests that during the Shijiahe period, the Jianghan Plain gradually became the cultural core of the Yangtze River's mid-lower reaches. However, throughout the entire Neolithic era, even during the peak of Shijiahe culture, the number of sites in the heartland of the Jianghan Plain remained very limited, with the majority of sites still located on the peripheries of the plain.

Based on the geomorphological environment surrounding these settlements, the author classifies the settlement locations in the Jianghan Plain during the Neolithic period into two distinct categories. The first category includes sites primarily distributed along or near the banks of the Yangtze River and its tributaries, where settlements were

commonly established close to water sources. These sites are relatively distant from high mountains and hills and are often situated on terraces, which may be either naturally occurring or artificially constructed. Such settlements are generally located far from the Yunmengze Lake group, on elevated terraces that may have been protected by flood prevention infrastructure, such as ditches, moats, city walls and drainage ponds, allowing most settlements to safely endure periodic floods. The Zoumaling ancient city site, located in the southwestern part of the Jianghan Plain, is a representative example of this type of site. Analysis of the archaeological reports on the Zoumaling site (走马岭遗址) reveals that the settlement is situated on a platform elevated approximately 2-10 metres above the surrounding terrain. The western side of the settlement is connected to Shangjin Lake, and multiple rivers and lakes are distributed around it, creating a dense lake network. [143] Due to its unique geographic setting, archaeologists have discovered not only basic flood defence structures such as city moats and walls but also water gates designed for boat access, which were uncommon in contemporary society. [144] These findings indicate that Neolithic humans were adept at utilizing natural resources and implementing appropriate modifications to their environment to improve living conditions. Based on the data from the archaeological report, this chapter includes a profile diagram of the Zoumaling ancient city environment (Figure 39), which provides a more intuitive understanding of the settlement characteristics of this type.

[143] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页 283-291. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei,* (Beijing: China Science Publishing & Media Ltd, 2015), pp: 283-191.

[144]单思伟，余西云，湖北石首市走马岭新石器时代城址的发掘，*《考古》*，9(2018)，页 3-24. / Siwei Shan, XIyun Yu, 'Excavation of the Neolithic Site at Zoumaling, Shishou City, Hubei', *Archaeology*, 9 (2018), pp. 3-24.

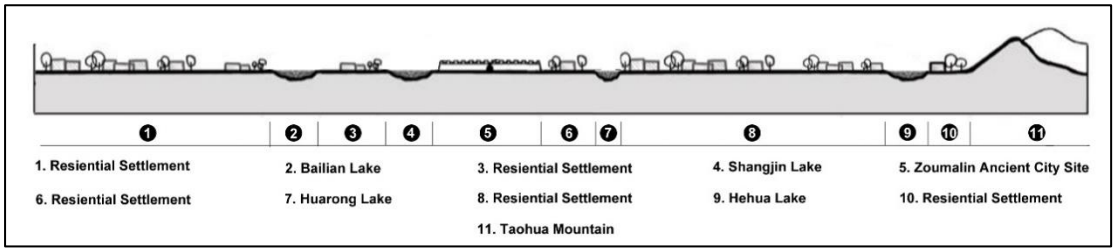


Figure 39. Profile map of the surrounding environment of the Zoumaling Ancient City Site (Source: created by the author)

The northern fringe of the Jianghan Plain, characterized by its plain-hill region, constitutes the primary distribution area for the second category of archaeological sites. This type of site is the most prevalent within the Jianghan Plain, significantly surpassing the number of first-category sites. These archaeological sites are typically dispersed across hillocky terrains at elevations higher than the central plain, maintaining a suitable distance from the Yunmengze lake cluster. They are situated with hills to their backs and the plain to their front, surrounded by numerous water sources and wetlands, which facilitate local agricultural activities. Inhabitants of these areas not only benefit from the advantages of the plain environment but can also relocate to the hillocky terrain during floods, leveraging its topographical features to maximize the safety of the residents. The Shijiahe site cluster is one of the most representative examples of this site type.

The Shijiahe site complex is situated in the transition zone between the northern part of the Jianghan Plain and the southern foothills of the Dahongshan Mountain. The topography of this area presents three distinct but contiguous landforms: the piedmont hills, the transitional zone, and the river-lake plain (Figure 40). Overall, the site complex is positioned adjacent to the Dahongshan Mountain ridges, creating an encircling pattern. To the south of the site complex lies an expansive agricultural area, with an elevation of less than 30 metres. Historically, this region was known as Beigang Lake (Figure 41), and according to local chronicles, it was once a large water body,

with the Shijiahe site complex located near its shoreline. [145]



Figure 40. Shijiahe archaeological site group and the foothills of Dahongshan Mountain （Source: captured by the author）



Figure 41. The southern section of the Shijiahe archaeological site group (Source: captured by the author)

To gain a deeper understanding of the geographical and landscape issues associated with this type of settlement, this study focuses on the southern slopes of the Dahongshan mountain region, centred around the Shijiahe site cluster, as the first research sample area. The objective is to explore the environmental characteristics of this area and the relationships between the settlement sites. Digital Elevation Model (DEM) data were acquired from the Google Earth platform using Bigemap GIS Office software to establish the topographical and geomorphological foundation of the study area. Subsequently, the hydrological analysis tools in ArcMap were employed to delineate the ridgelines and valleys of the region. Additionally, high-resolution satellite imagery of the study area, obtained from Google Earth, was analysed using AIEARTH to identify and extract building outlines. By overlaying these data results and referencing

[145] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*,（00）1993，页 213-294 / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.

the 35 prehistoric settlement site coordinates provided in the *Dahongshan Southern Slope Prehistoric Settlement Survey Report* by the Hubei Provincial Institute of Cultural Relics and Archaeology, both the settlements and the Shijiahe site cluster were marked on the maps, resulting in the production of a geomorphological environment map for the study area (Figure 42). [146]

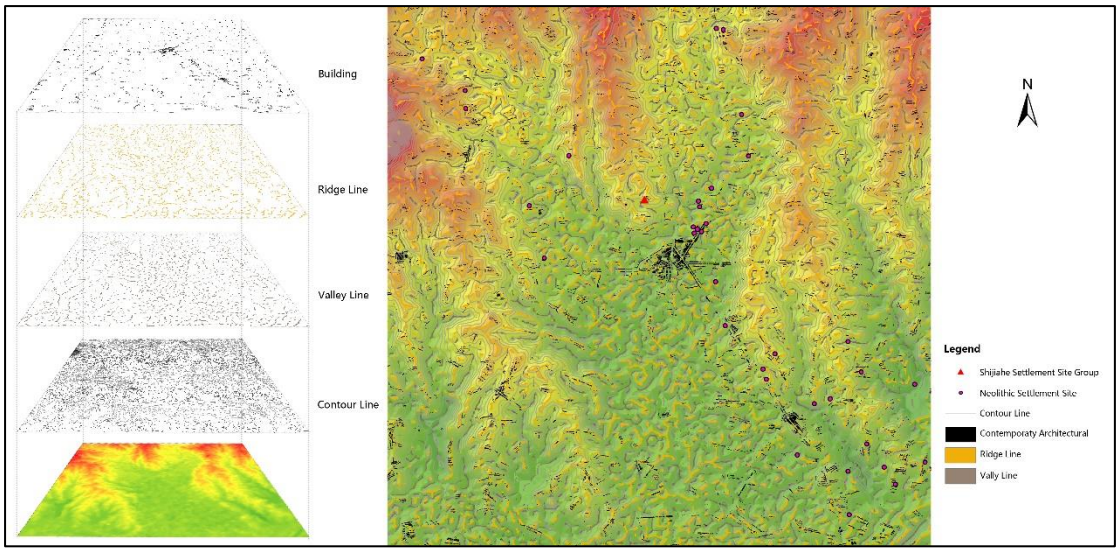


Figure 42. Geographical and Topographical Map of the Southern Foot of the Dahongshan Mountain (Source: created by the author use ArcMap)

The results indicate that the majority of settlement sites are located along ridge lines, and these settlements are distributed in alignment with the direction of the ridges. This prompts the question of why prehistoric people of the Neolithic period chose to establish settlements along ridge lines. This paper hypothesizes five possible reasons:

1. Safety and Defence: In ancient times, settlements lacked the technological means to fully protect themselves from the threat of floods. As a result, elevated terrains such as hills and ridges served as natural refuges. Additionally, the

[146] 湖北省文物考古研究所，<大洪山南麓史前聚落调查-以石家河为中心>，*《江汉考古》*，（01）2009，页 3-23，（第 22-23 页）. / Hubei Institute of Cultural Relics and Archaeology, 'A Surrey of Prehistoric Settlements Surrounding the Shijiahe Centre in Southern Dahongshan Mount', *Jianghan Archaeology*, (01) 2009, pp. 3-23, (pp. 22-23).

elevated geographic locations allowed for a broader view, facilitating surveillance of the surrounding environment and early detection of potential external threats.

2. Water Sources and Resources: Settlements near ridges were typically close to water sources, such as mountain springs and streams. For early inhabitants who lacked irrigation technology, these water sources were crucial for agriculture and daily life. Moreover, the natural environment of hilly areas provided residents with abundant wild plants and animals, offering diverse dietary options.

3. Development of Rice Agriculture: In areas with ample water resources and suitable land, residents could strategically place rice paddies according to the topography, selecting lower elevation plains for farming and ensuring that residential areas were situated at higher elevations. This arrangement met the needs of nearby labor while minimizing the risk of flooding affecting the living areas.

4. Climate Effects: Ridges can mitigate the impact of winter cold fronts on surrounding settlements, creating a more hospitable microclimate for human habitation.

5. Land Transportation: Using high-resolution satellite imagery from AIEARTH, road network centrelines were extracted and overlaid with the geographic and geomorphological maps of the study area. The results show that some settlements within the research area are connected by roads, with many secondary and tertiary roads intersecting with the

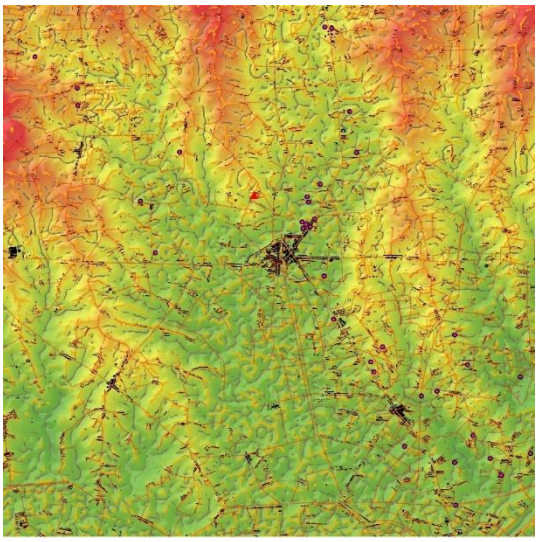


Figure 43. Road network overlay (Source: created by the author, use ArcMap)

ridge lines, and in some cases, aligning precisely with them (Figure 43). Therefore, it is hypothesized that prehistoric transportation routes were likely constructed along ridges, with settlements distributed around these ridge lines. Ancient ridge routes facilitated cultural exchange and trade between settlements and provided safe corridors for relocation during floods, thus ensuring spatial continuity between different settlements.

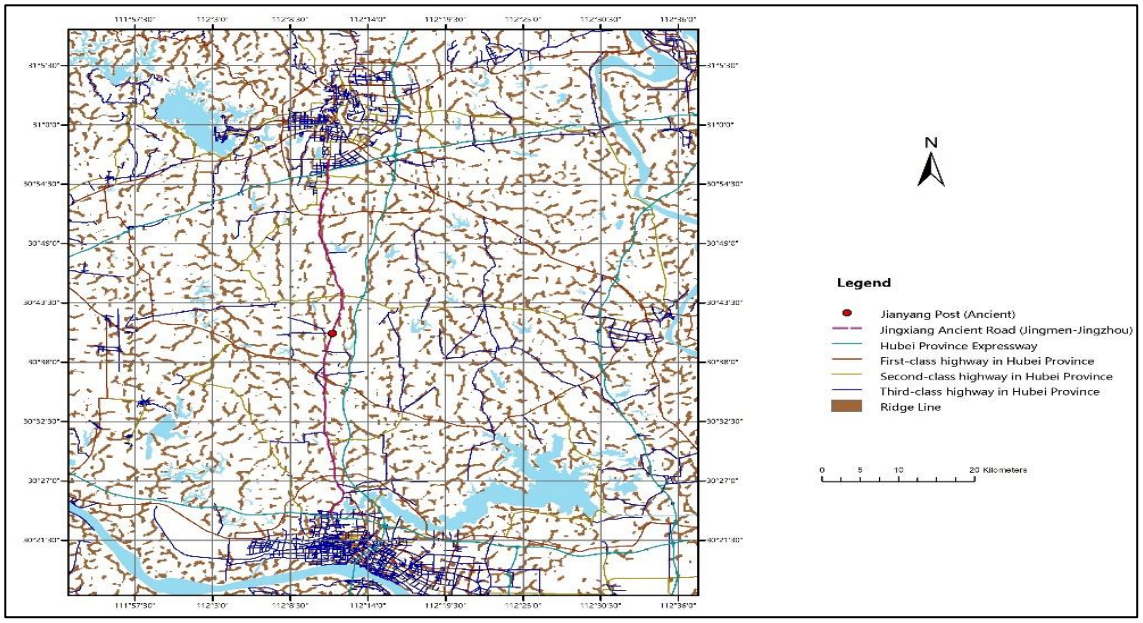


Figure 44. The encompassing geographical surroundings of the Jingxiang ancient road (Source: created by the author, use ArcMap)

To validate this hypothesis, the study examines the Jingxiang Ancient Road segment from Jingmen to Jingzhou within the Jianghan Plain as a second research sample (Figure 44). The Jingxiang Ancient Road, an important historical route connecting the Central Plains and the Jingchu region, dates back to the pre-Shang and Zhou periods.[147] By combining definitions from Shi's thesis on the spatial distribution of the ancient road, textual records from the *General Annals of Hubei Province (《湖北通志》)*, and

[147]石伟.<基于协同理论的荆襄古道遗产廊道构建研究>,（硕士论文：华中农业大学，2022） / Wei Shi, 'Research on the Construction of Heritage Corridor of Jingxiang Ancient Road Based on Synergetic Theory', (Master Thesis: Huazhong Agricultural University, 2002).



Figure 45. Jingxiang Ancient Road Remains. (Source: Jingzhou Archive, 'The site of the Jingxiang Ancient Road', Jingzhou Archives Information Network, 2008, <http://www.jmdaxxw.com/read.asp?id=704>, [accessed 13 January 2021])

the current spatial position of National Road 207, the position of the Jingxiang Ancient Road in the Jianghan Plain was confirmed. Using ArcMap software, ridge lines around the Jingxiang Ancient Road were extracted and overlaid. The results showed a high degree of spatial overlap between the ancient road and ridge lines (Figure 45). To visually substantiate this, a three-dimensional simulation of the geographic and geomorphological environment of the second research area was performed using ArcScene software (Figure 46). The simulation clearly indicates that the Jingxiang Ancient Road was constructed along the ridge lines, further confirming that Neolithic people in the Jianghan Plain likely built transportation routes along ridge lines or surrounding mountain lines.

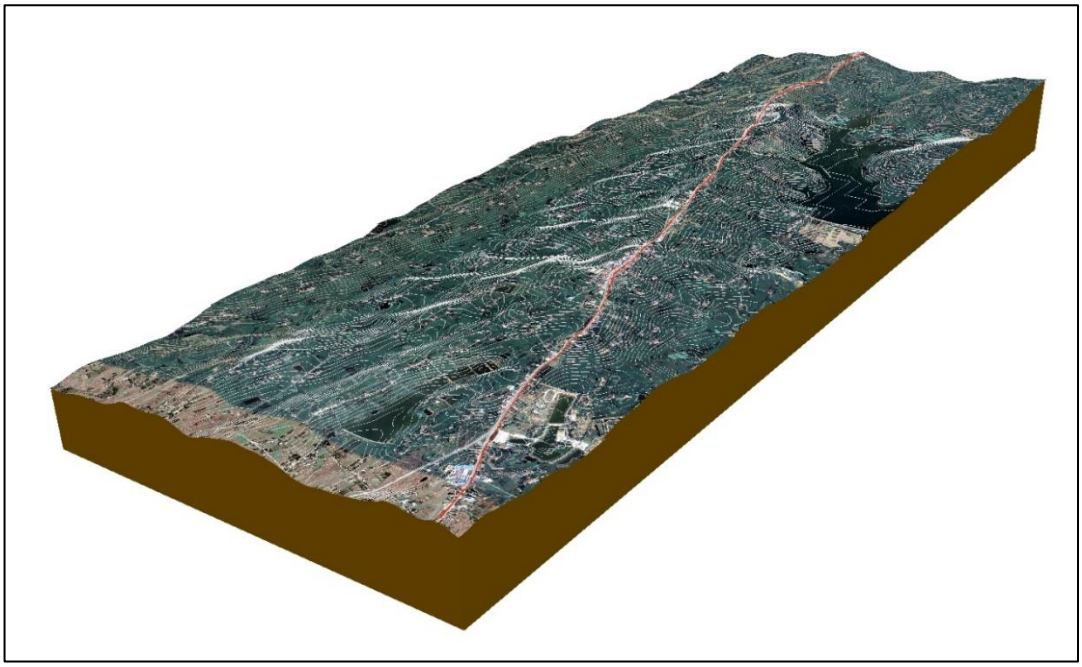


Figure 46. Three-Dimensional Simulation of the Geographical Surroundings of the Historic Jingxiang Ancient Road (Source: created by the author, use ArcMap)

It is important to note that, across China, the use of ridge lines or mountain perimeters as transportation routes with informational functions is not unique to the Jianghan Plain. The Great Wall, which has been continuously constructed and expanded over more than 2,000 years since the Spring and Autumn and Warring States periods, stands as a representative example of the profound integration of China's natural landscape and cultural heritage. The Wall is situated in the region where nomadic and agrarian civilizations intersect, and its layout takes advantage of the mountain ranges within the region. [148] This strategic positioning has fostered the development of various defensive cultural landscapes, including cities, barriers, pavilions, and markers, as well as defensive service landscapes like town walls, route fortifications, city garrisons and fortresses, which collectively form a tightly coordinated linear military defence system. During the Ming Dynasty, this defence system included over 1,000 fortresses of various

[148]代晶晶，聂跃平，<基于高分辨率遥感数据的长城自动提取实验研究>，*《遥感技术与应用》*，4（2007），页 520-523. / Jinjin Dai, Yueping Nie, 'Extraction of the Great Wall Information Using High Spatial Resolution Images', *Remote Sensing Technology and Application,* 4 (2007), pp. 520-523.

sizes, capable of accommodating a million soldiers. [149] The land bridge corridor thus became a cultural landscape corridor characterized by a high degree of aggregation, incorporating city walls, passageways, signal towers, military fortresses [150] and agricultural settlements, all with the functional capability of beacon signal transmission.

In summary, the combination of these factors reflects the wisdom of the Neolithic inhabitants of the Jianghan Plain in terms of environmental adaptation and social organization. During the process of selecting settlement sites and residential strategies, the relationship between settlement locations and ridge lines illustrates their comprehensive consideration of living conditions and residential safety. This interrelated nature facilitated a seamless integration between geographical and cultural landscapes in primitive societies, with humans continuously adapting to the natural environment and making full use of environmental resources through harmonious coexistence with nature.

Patterns of settlements

As indicated in the preceding discussion, due to geographic constraints and the impact of flooding, prior to the mid-Neolithic period, early settlers typically chose to reside in higher elevation areas surrounding the Jianghan Plain. These settlements exhibited a small-scale, dispersed pattern of habitation. In this settlement pattern, inhabitants lived in a self-sufficient manner, with each settlement relatively isolated and characterized

[149] 李严，张玉坤，李哲，<明长城防御体系整体性保护策略>，*《中国文化遗产》*，3（2008），页 48-54. / Yan Li, Yukun Zhang, Zhe Li,'Integrity Protection Strategies for the Defence System of the Ming Great Wall', *China Cultural Heritage*, 3 (2008), pp. 48-54.

[150] 孙靖国，<明代雁北地区城堡的职能与选址特征>，*《中国历史地理论丛》*，4（2011），页 105-117. / Jingguo Sun, 'Functions and Location Selection of Official Walled Settlements in North-to-Yanmen Pass Zone During Ming Dynasty', *Journal of Chinese Historical Geography*, 4 (2001), pp. 105-117.

by a low population capacity. [151] At this time, settlements were commonly established along the Yangtze River, arranged in a linear distribution along its basin (Figure 47). While this settlement pattern facilitated easy access to water resources, the space available for agricultural cultivation was limited, resulting in a relatively slower overall development. Conversely, proximity to the Yangtze River led to a more developed subsistence economy based on foraging and fishing, which provided a greater abundance of living resources and livelihood space. This period was notably characterized by the presence of temporary habitation sites around the Jianghan Plain.

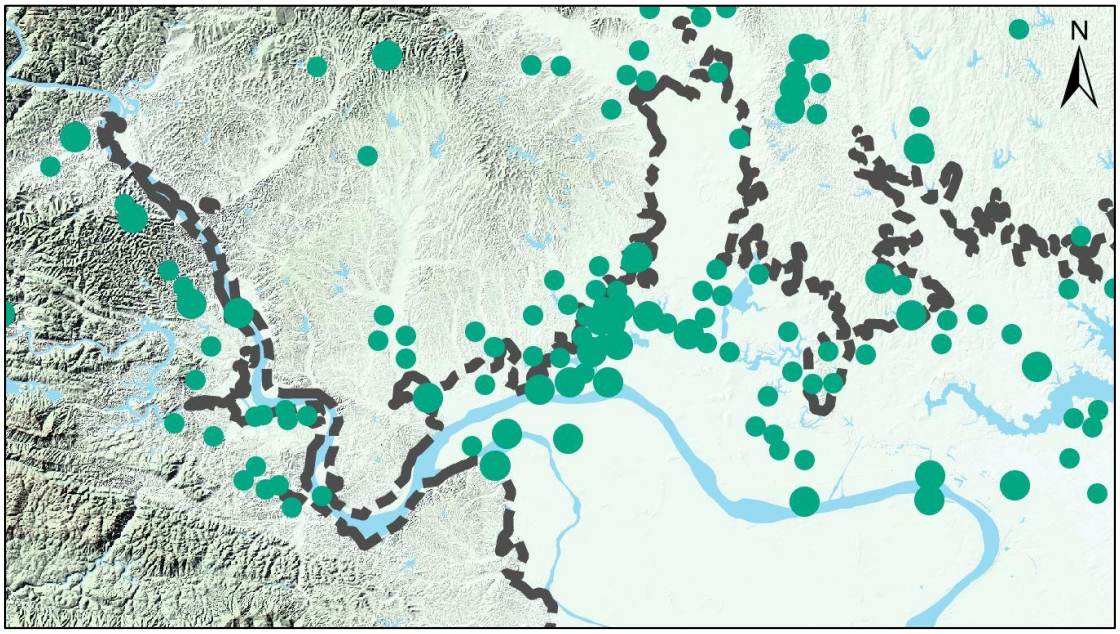


Figure 47. Distribution map of settlements along the Yangtze River. (Source: created by the author)

In the dispersed settlement pattern, the distances between different settlements are generally considerable. Even the nearest settlements are maintained at a distance to ensure that their respective agricultural production areas do not overlap. [152] This type of settlement pattern is considered a primitive form that has existed since before the

[151] 长江文明馆编，*《长江中游地区新石器时代的人地关系研究》*，(武汉：长江出版社，2015)，页 135. / Yangtze River Civilization Museum, *Study of Human-Environment Relationships in the Middle Yangtze River Region During the Neolithic Era*, (Wuhan: Changjiang Press, 2015), p. 135.

[152] 长江文明馆编，*《长江中游地区新石器时代的人地关系研究》*，(武汉：长江出版社，2015)，页 135. / Yangtze River Civilization Museum, *Study of Human-Environment Relationships in the Middle Yangtze River Region During the Neolithic Era*, (Wuhan: Changjiang Press, 2015), p. 135.

mid-Neolithic period and has continued to this day. [153]



Figure 48. Scattered villages in the Jianghan Plain (Quiling Village is located in the Qujialing Administrative Area of Jingmen City, Hubei Province.) (source: Captured by the author)

Walking through the Jianghan Plain today, particularly in areas vulnerable to flooding, such as the flood-prone plains and valleys, as well as in the hilly regions with dispersed water resources, one can still find scattered villages. In the flat paddy field areas, small villages are commonly located in the centre of rice paddies or alongside rivers and lakes. Each village typically consists of around ten households, situated on slightly elevated land (Figure 48). The residences of each farmer are distributed sporadically, with individuals attempting to reside as close as possible to their farmland and water sources.



Figure 49. Villages in the Jianghan Plain. (Tanjialing Village is located in Shihe Town, Tianmen City, Hubei Province.)（Source: Captured by the author）

This pattern of dispersed villages is characterized by homes located in proximity to cultivated land, with the residences and other auxiliary buildings often constructed near the fields. Furthermore, each lower area is frequently surrounded by walls,

[153] 鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 190. / XiqiLu, *Man-land relationship and regional society in the middle reaches of the Yangtze River*, (Xiamen: Xiamen University Press, 2016), p. 190.

fences, and ditches (Figure 49). This type of village, which inherits the dispersed settlement model from the Neolithic era, demonstrates a better adaptation to the agricultural lifestyle of the plains.

During the late Neolithic period, with the ongoing warming temperatures and the retreat of lakes on the Jianghan Plain, the land characteristics of the plain became increasingly conducive to both the development of agriculture, such as rice cultivation, and human habitation. [154] Consequently, populations began to migrate from the peripheral hilly areas to the interior of the plain. The expansive plain and abundant natural resources greatly pleased the ancestors, leading them to establish permanent settlements and engage in large-scale rice agriculture. During this time, there was a notable increase in the number of settlements, with those situated in areas less prone to flooding generally experiencing longer periods of habitation. In some regions, a pattern of settlement clusters emerged.

Due to the influence of social development and natural factors, significant cultural integration has occurred among the various settlements in the Jianghan Plain, leading to an increase in the productivity levels of these settlements. [155] With the rise in population and productivity, individuals from different settlements began to interact and form close kinship ties to counter external threats and enhance production levels. This interaction led to the formation of settlement groups, with some settlements even developing hierarchical structures. Settlements with larger areas and significant architectural structures often functioned as central settlements, where the nobility typically resided. Based on these characteristics, this paper designates such settlements

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[154] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 348-349 / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), p. 348-349.

[155] 长江文明馆编，《*长江中游地区新石器时代的人地关系研究*》，（武汉：长江出版社，2015），页 148 / Yangtze River Civilization Museum*, Study of Human-Environment Relationships in the Middle Yangtze River Region During the Neolithic Era*, (Wuhan: Changjiang Press, 2015), p. 148.

as the ‘central settlement model’, which represents a specific type within the settlement group model.

The development of the central settlement model established the city-moat settlement pattern of the late Neolithic period in the Jianghan Plain. This model typically represents the central settlement among a group of settlements, holding the highest authority within the settlement cluster. These settlements feature the fundamental components of urban centres, including city moats and walls, and exhibit clear internal zoning, which allows them to be partially defined as ancient cities. The emergence and development of these settlements had a significant positive impact on the rise of urban centres in subsequent civilizations.

Based on the analysis of settlement development in the Jianghan Plain, this paper proposes that Neolithic settlement patterns should be categorized into two primary types: 1) dispersed settlement patterns, and 2) collective settlement patterns. The collective settlement pattern is further composed of two subtypes: the central settlement pattern and the moated settlement pattern (Figure 50).

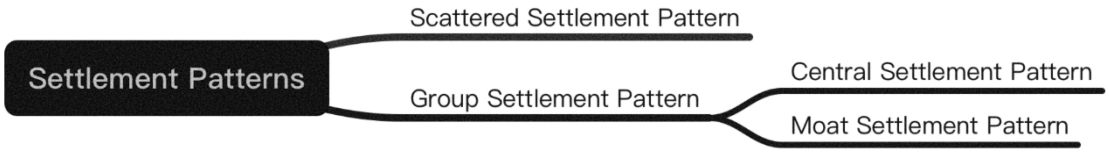


Figure 50. Settlement Patterns in the Jianghan Plain during the Neolithic Age (Source: created by the author)

The following text will present an analysis of two nearly contemporaneous settlements as examples: one being the city moats settlement represented by the Zoumaling site, and the other being the central settlement exemplified by the Shijiahe site. By

examining the specific landscape characteristics of both, a clear understanding of the aforementioned settlement patterns will be attained.

Zoumaling Site

An examination of aerial photograph of the Zuomaling settlement site reveals the presence of distinct boundary lines (Figure 51). Subsequent on-site investigations and a review of related archaeological literature have provided further insights into this site. Firstly, during the field survey, it was observed that the site has been covered by modern farmland, with only a few contemporary rural dwellings present. The survey also identified irregular rectangular terrace boundary lines (Figure 52), which align with the archaeological reports describing the site as being situated on a terrace to the southeast of Shangjin Lake, and exhibiting an irregular rectangular shape. [156]



Figure 51. Aerial photograph of the ancient remains of Zoumaling settlement site. (Source: 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 18. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 18)

[156]单思伟,余西云，<湖北石首市走马岭新石器时代城址的发掘>，*《考古》*, 9（2018），页 3-24 / Siwei Shan, Xiyun Yu, 'Excavation of the Neolithic site at Zhaomaling, Shishou City, Hubei', *Archaeology,* 9 (2018), pp. 3-24.

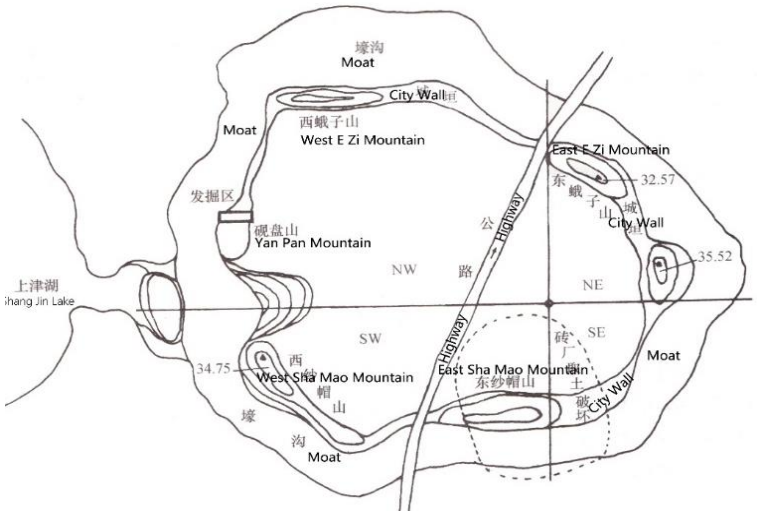


Figure 52. Zoumaling settlement site plan. (Source: 陈官涛，〈湖北石首市走马岭新石器时代遗址发掘简报〉，《考古》，4（1998），页 16-38. / Guantao Chen, Excavation Brief of the Neolithic Site at Zhaomaling, Shishou, Hubei', *Archaeology*, 4 (1998), p 16-38.)



Figure 53. Zoumaling Settlement Site Ruins' location (Source: created by the author, based on the Google Earth)

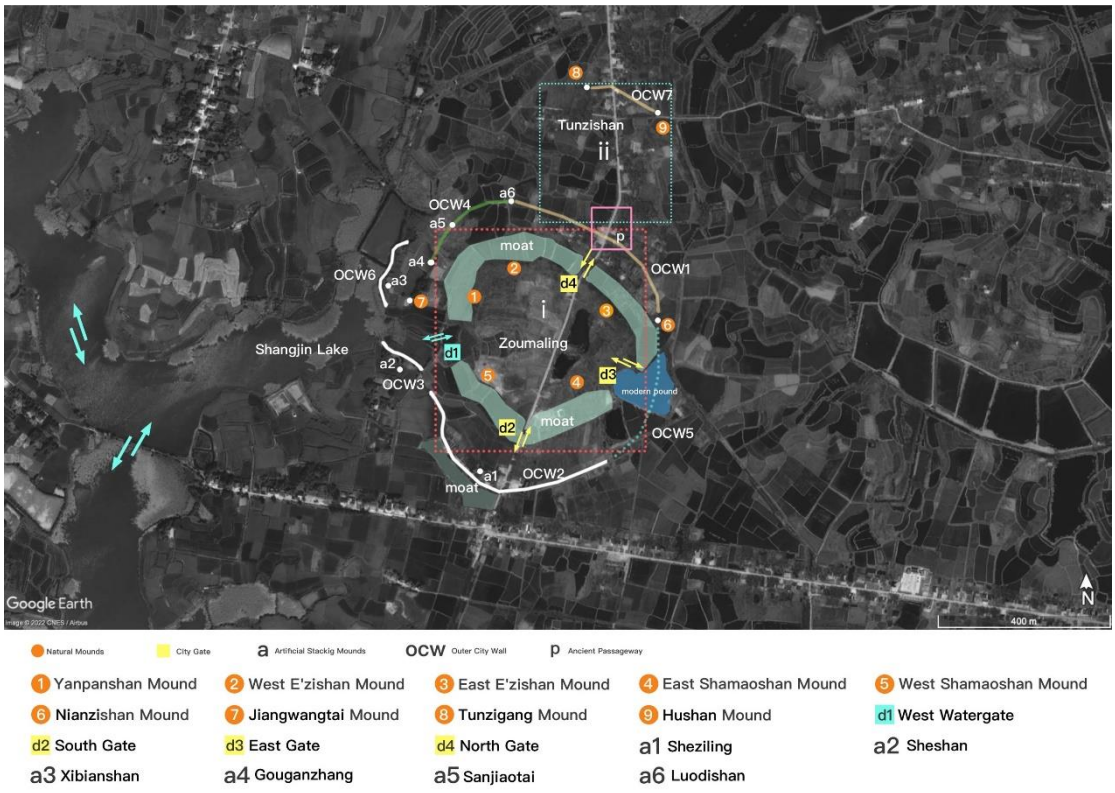


Figure 54. Zoumaling Settlement Site Analysis Map. (Source: created by the author, based on the Google Earth)

Secondly, the following three key pieces of information about the site were noted: 1. The terrace where the site is located is elevated 2-5 metres above the surrounding terrain; 2. The settlement is situated to the southwest of the Yangtze River, approximately 10 kilometres from it (Figure 53); 3. The western side of the settlement connects to Shangjin Lake, with numerous rivers and lakes in the vicinity, creating a dense lake network; 4. The total area of the site is approximately 80,000 square metres. To more clearly illustrate and analyse the remaining landscape features at the Zuomaling site, different landscape elements will be represented using letters and numbers and marked on the satellite image (Figure 54).

The site is surrounded by five natural earth mounds, elevated above the settlement area, which are labelled as numbers 1, 2, 3, 4, and 5 in figure 54. These mounds form a circular arrangement, creating a relatively complete boundary line. Archaeological

reports indicate the presence of a complete city wall system in this area, with a well-preserved moat encircling the outer perimeter of the wall. [157] Consequently, it can be inferred that the interior of this boundary line represents the central site of the Zouma Ling settlement.

Additionally, four gaps marked as ‘d1,’ ‘d2,’ ‘d3,’ and ‘d4’ are distributed in the east, west, south, and north directions of the ancient city of Zouma Ling. According to archaeological records, these gaps are remnants of gates from the Neolithic period. The gap labelled ‘d1’ is particularly notable as it connects to the Upper Jin Lake, suggesting that it may have served as a water gate. Therefore, it can be inferred that the transportation system of the ancient city of Zouma Ling was composed of both water and land routes. The water gate on the western side of the settlement likely served as the primary route for water-based transportation, while the other three gates, located on the eastern, southern, and northern sides of the site, collectively facilitated land-based transportation.

In Figure 54, the feature marked as ‘7’ is a natural mound known as Jiang Wangtai, situated strategically between the western water gate (d1) of the Zouma Ridge ancient city and the Changjin Lake. This mound, elevated approximately 2 metres above the surrounding area and about 3 metres above the lake surface, is a natural prominence. [158] To the west of this mound, another mound labelled ‘a3’ is located. Archaeological evidence suggests that this may have been the site of a ‘waterside defensive structure’ constructed by the ancestors. It is hypothesized that the natural mound ‘7’ alone may

[157]陈官涛,<湖北石首市走马岭新石器时代遗址发掘简报>,*《考古》*, 4（1998），页 16-38 / Guantao Chen, Excavation Brief of the Neolithic Site at Zhaomaling, Shishou, Hubei*'*, *Archaeology,* 4 (1998), pp. 16-38.

[158] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*,（00）1993，页 213-294，（第 289 页） / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, ‘An Investigation Report on Shijiahe Sites’, *South Ethnology and Archaeology*, (00) 1993, pp. 213-294, (p. 289).

not have adequately met the ancestral need for flood protection and defence against external threats. Consequently, an additional ‘waterside defensive structure’ was built to the west of the settlement, near Changjin Lake.

The feature marked ‘a2’ in the figure is an artificial mound known as Snake Mountain, constructed near Changjin Lake and positioned directly opposite ‘a3’. [159] It is conjectured that ‘a2’ served a function similar to ‘a3’, and together they formed a lakeside defensive system, representing the primary line of defence on the side of the ancient city facing Changjin Lake.

The two arcuate mounds labelled as 'ocw3' and 'ocw6' in the image have been verified by archaeological reports as having been constructed during the Neolithic period. [160] Based on the earlier analysis indicating that 'a2' and 'a3' possess defensive value and considering their geographical locations, it is inferred that these two artificial mounds are part of the outer city wall of the Zoumaling ancient city.

Simultaneously, the three points marked as 'a4', 'a5', and 'a6' in Figure 54 are also clearly visible in the aerial survey images of the site (Figure 55). These points correspond to three mounds located on the northwest side of the settlement, which are interconnected by linear soil ridges. According to archaeological reports, these mounds are identified as artificial constructions from the Neolithic period. It is therefore reasonable to hypothesize that these are part of a curved artificial earthwork, which also constitutes a section of the outer city wall. Consequently, connecting the points 'a4', 'a5', and 'a6' yields the designation 'OCW4'.

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[159] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*,（00）1993，页 213-294 / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, ‘An Investigation Report on Shijiahe Sites’, *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.

[160]陈官涛,<湖北石首市走马岭新石器时代遗址发掘简报>,*《考古》*, 4（1998），页 16-38 / Guantao Chen, Excavation Brief of the Neolithic Site at Zhaomaling, Shishou, Hubei*’*, *Archaeology,* 4 (1998), pp. 16-38.



Figure 55. Aerial photograhp of the ancient remains of Zoumaling settlement site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，〈石家河遗址群调查报告〉，*《南方民族考古》*，（00）1993，彩页 19. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, p. colour plate 19.)

Similarly, the point designated as 'a1' is located outside the northern moat of the Zouma Ling settlement and consists of an artificially constructed, arcuate terrace. Given the unique morphology and location of 'a1,' it is plausible to infer that this site also represents a segment of the outer city wall of the ancient Zouma Ling city, which is identified as 'OCW2.' Interestingly, site surveys reveal that some residents still inhabit the terrace marked 'OCW2.' Additionally, aerial imagery (Figure 56) clearly shows a distinct arcuate earthen mound between 'a6' to the northwest and '6' to the northeast of the Zouma Ling settlement, which partially encloses the ancient city ruins. Based on its formation, this mound is likely another segment of the outer city wall. The arc formed by connecting 'a6' and '6' is designated as 'OCW1.'



Figure 56. Aerial photograph of the ancient remains of Zoumaling settlement site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，彩页 18. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, p. colour plate 18.)

If the segments 'OWC1', 'OWC2', 'OWC3', 'OWC4', and 'OWC6' are connected on Figure 54, a distinct boundary line encircling the ancient city becomes apparent, although this boundary line is not complete. The reason for this incompleteness is the presence of a modern pond on the western side of the Zouma Ridge settlement, which disrupts the continuity of the outer city wall boundary. By comparing the shapes of the various terraces and the arcs and forms marked as 'OCW' mentioned earlier, it is evident that 'OCW1' and 'OCW2' can be connected in a plane, though there may be a segment of the city wall missing in between. If this 'missing mound' is depicted on the map and labelled as 'OCW5', and 'OWC1' through 'OWC6' are connected, an almost complete irregular elliptical shape emerges around the settlement's perimeter. Thus, the irregular elliptical boundary formed by these six arc-shaped mounds is likely the outer city wall of the Zoumaling ancient city.

In addition to the outer city wall, the plateau marked as 'ii' in Figure 54 is also of considerable interest. Situated adjacent to the northern side of the Zuomaling settlement, this plateau has been designated by archaeologists as Tunzishan mountain. [161] According to the 1974 aerial survey map, which outlines the topography around the Zoumaling ancient city (Figure 57), the contour lines across the entire settlement area indicate that the elevation of Tunzishan mountain is comparable to that of the Zoumaling ancient city. Tunzishan mountain exhibits a highly irregular shape and is slightly smaller in area than Zuomaling. Examination of relevant archaeological reports reveals that, similar to Zoumaling, Tunzishan mountain also features city walls. Aside from the highest point in the northern section 'and part of the southern perimeter, where natural soil mounds are used as part of the city wall, the majority of Tunzishan's city walls are constructed through artificial

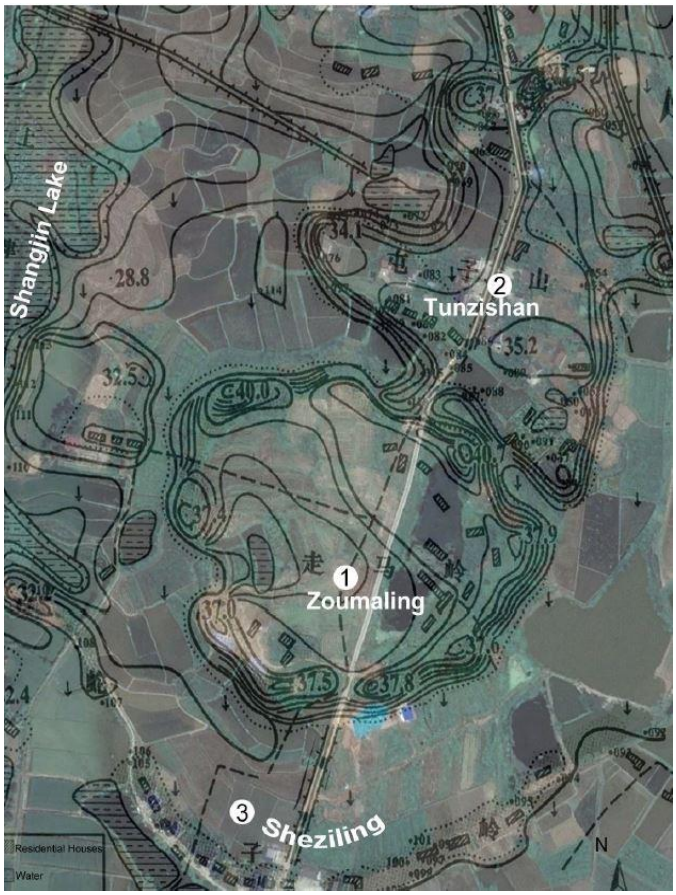


Figure 57. Topographic map of the Zoumaling ancient city (Source: recreated by the author, based on 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*,（00）1993，页 213-294，（第 228 页）. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294, (p. 228).)

[161] 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*,（00）1993，页 213-294，（第 228 页） / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294, (p. 228).

accumulation.[162] This raises the question: does Tunzishan, with its city walls, also possess a defensive ditch similar to that of Zoumaling? Field investigations reveal that the area surrounding the current city walls is predominantly cultivated with rice paddies, leaving no clear traces of a defensive ditch. However, relevant archaeological reports indicate that excavations have uncovered remnants of a defensive ditch outside the city walls of Tunzishan. Notably, the defensive ditch of Tunzishan does not form a complete connection with that of Zoumaling, as each site has its own distinct defensive ditch boundary.

Regarding the relationship between Zoumaling ancient city and Tunzishan moutain, some archaeologists propose that these two sites functioned as independent settlements, although they were closely related. [163] Another hypothesis suggests a subordinate relationship, where Zoumaling was the 'main city' and Tunzishan served as a 'satellite city' intended to protect the 'main city.' This paper supports the latter hypothesis, as the distance between Tunzishan and Zoumaling is approximately 50 metres, with a 'corridor' area between them, denoted as 'P' in Figure 54. Analysis of the contour lines on the topographic map reveals no signs of discontinuity in the 'P' area (Figure 58).

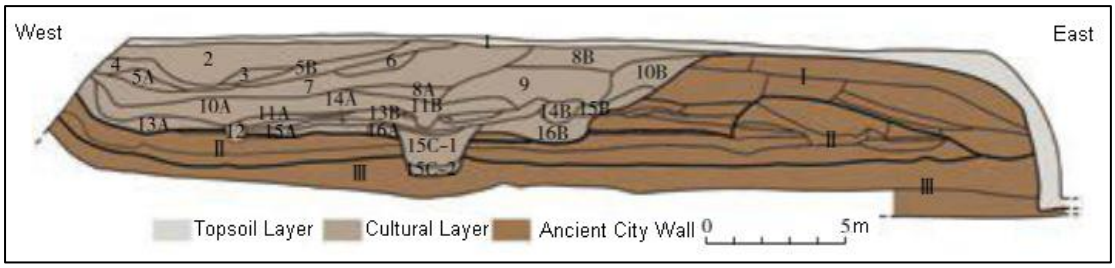


Figure 58. Zoumaling Settlement Site City Wall Profile Diagram. (Source: 单思伟，余西云，<湖北石首市走马岭新石器时代城址的发掘>，*《考古》*，9（2018），页 3-24. / Siwei Shan, Xiyun Yu, 'Excavation of the Neolithic site at Zhaomaling, Shishou City, Hubei', Archaeology, 9 (2018), pp. 3-24.)

[162]陈官涛,<湖北石首市走马岭新石器时代遗址发掘简报>,*《考古》*,4（1998），页 16-38,（第 22 页）/Guantao Chen, Excavation Brief of the Neolithic Site at Zhaomaling, Shishou, Hubei', *Archaeology,* 4 (1998), pp. 16-38, (p. 22).

[163]单思伟,余西云，<湖北石首市走马岭新石器时代城址的发掘>，*《考古》*，9（2018），页 3-24 / Siwei Shan, Xiyun Yu, 'Excavation of the Neolithic site at Zhaomaling, Shishou City, Hubei', *Archaeology,* 9 (2018), pp. 3-24.

Thus, this study identifies the area as a 'public corridor' shared between Zuo Ma Ling and Tunzishan (Figure 59). According to archaeological reports, archaeologists conducted drilling experiments in this public corridor, revealing that the terrace at point 'p' was not artificially constructed, but rather, the original natural topography was skilfully utilized by the inhabitants. [164] This public corridor enabled the two regions to form a relatively independent yet interlinked settlement pattern. Furthermore, the ancient city of Zoumaling features a defensive system with dual city moats and dual city walls, which is significantly more advanced than that of Tunzishan. Therefore, it is highly likely that Tunzishan was constructed to enhance the defensive capabilities of the ancient city of Zuomaling.



Figure 59. Aerial photograhp of the ancient remains of Zoumaling settlement site. ('p' area) (Source: 孟华平，向其芳，*《湖北史前城址》*，（北京：科学出版社，2015），彩页 20. / Huaping Meng, Qifang Xiang, *Prehistoric City Sites in Hubei,* (Beijing: Science Press, 2015), p. colour plate 20.)

Thus, the overall boundary of the Zuomaling settlement cluster exhibits a dumbbell shape. The upper portion of the dumbbell is occupied by Tunzi Mountain, which is likely to be the 'Wengcheng' (瓮城) [165] associated with the lower part of the Zuomaling Ancient City,

[164]孟华平，向其芳，*《湖北史前城址》*，（北京：科学出版社，2015），页 288-289 / Huaping Meng, Qifang Xiang, *Prehistoric City Sites in Hubei,* (Beijing: Science Press, 2015), p. 288-289.

[165] 'Wengcheng': A barbican is an outer fortified gateway in front of a city gate or castle entrance, providing extra defence.

primarily serving to protect the ancient city. The central section of the ‘dumbbell’ functions as a corridor connecting Tunzishan to the settlement; this corridor is formed by natural topography, indicating that Neolithic peoples were already utilizing the natural environment as an integral part of their settlement construction. The Zuomaling Ancient City, located in the lower half of the dumbbell shape, features four city gates: three land gates and one water gate. The water gate, situated on the western side of the city, connects to the Shangjin River, serving as the only water route linking the Zuomaling to external areas. An intriguing discovery is that, unlike other contemporary sites where the city moats are typically located outside the city walls, the moat of the Zuomaling Ancient City is situated on the inner side of the walls. This anomaly is hypothesized to be due to the specific topographical conditions of the area.

Based on this, the present study proposes a bold hypothesis: the ancient inhabitants directly constructed a water gate to connect the Shangjin River with the city's internal water system. Consequently, the water from the Shangjin River could flow directly into the ancient city, resulting in three key impacts. First, transportation would be enhanced, allowing people to travel from within the city to the Shangjin River via the water gate, thereby establishing waterway connections with other settlements in addition to overland routes. Second, the river's water could be channelled into the city moat to provide defence against external threats. Third, the introduced river water could be used for irrigating the city's fields and supplying potable water for the inhabitants. To this day, modern rice fields covering the Zuomaling ancient city site still receive irrigation from the Shangjin River.

Additionally, an interesting discovery emerges when overlaying the topographic maps presented in the archaeological report with contemporary satellite images: a modern county road precisely intersects the northern and southern gates of the Zoumaling ancient city, as well as the surrounding areas of Tunzishan and the public corridor. This observation suggests that the topographical features of the Zoumaling settlement continue to influence the landscape today, with the remnants of ancient ingenuity still reflecting their unique historical character.

Unfortunately, there is a lack of clearly identified architectural remains from the New Period within the Zuomaling settlement, limiting the ability to conduct specific analyses of internal residential and other landscape elements. However, Zoumaling remains notable as one of China's earliest cities with an inner and outer city structure, including features such as the 'Wengcheng (瓮城)' and water gate, which laid the foundation for the basic urban layout in China.

Large ancient city (central settlement) - Shijiahe ancient city

The Shijiahe ancient city site, contemporaneous with the Zoumaling settlement mentioned earlier, represents the largest, longest-lasting, highest-ranking, and most complex urban settlement site of the Neolithic period in the Jianghan Plain region. [166] As an example of a large Neolithic moated settlement in the Jianghan Plain, it embodies both the central settlement and moated settlement models. Its scale is comparable to modern metropolitan areas and could be described as an ancient 'city-state' (Figure 60). This site epitomizes the highest level of urban construction during this period in the Jianghan Plain. Detailed analysis of the site reveals its unique man-made landscape layout, constituent elements, and cultural significance, based on its natural environment. Exploring the social functions of this landscape will provide crucial insights into the construction of ancient settlement landscapes.

[166] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：1-2. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 1-2.)

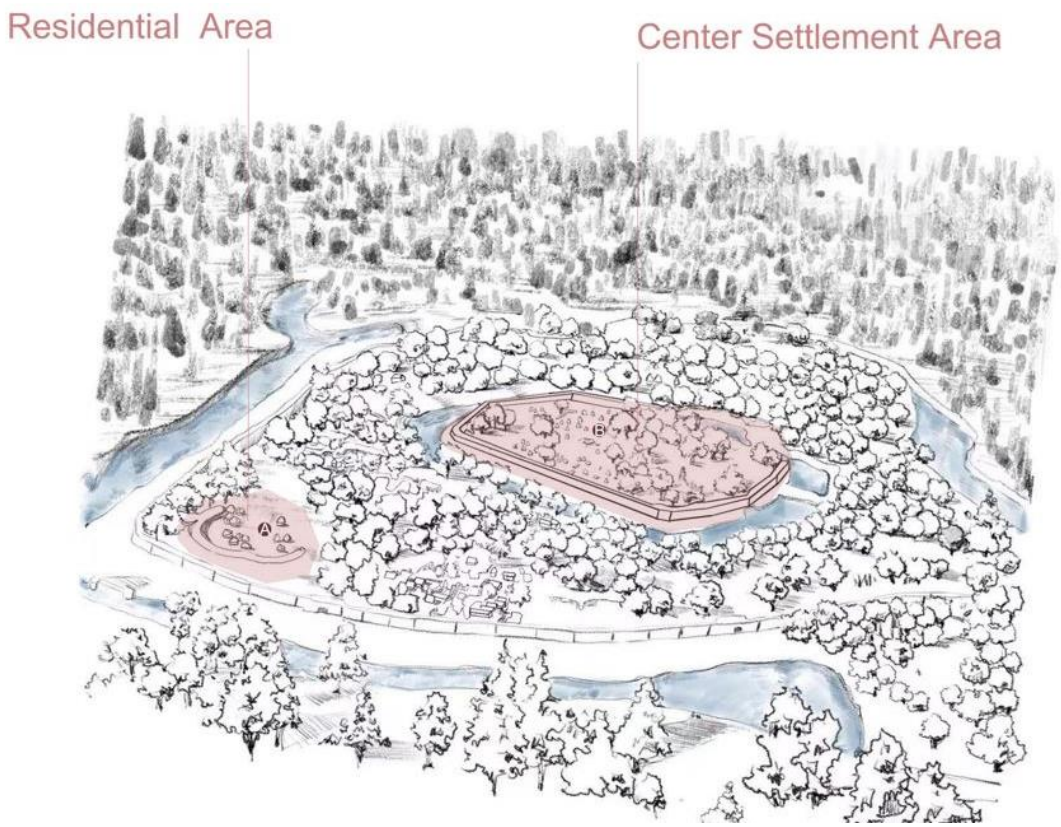


Figure 60. Aerial view of Shijiahe Ancient City Settlement. (Source: created by the author, based on 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.))

This region, comprising 36 settlements, represents a 'confederated city-state ancient country' (Figure 61). The site is characterized by a topography that transitions from low hilly terrain in the foothills to river and lake plains. To the south, there is an extensive plain area with an elevation of less than 30 metres, which has been almost entirely converted into farmland. Historical records indicate that, until the Qing Dynasty, this area was predominantly occupied by a large lake, which has since been reclaimed and vanished. [167] From a broader geomorphological perspective, the site is located on the eastern side of the southern end of a short ridge nestled between two major mountain

[167] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：88-89. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 88-89.)

ridges. These ridges encircle the entire Shijiahe site (Figure 62). Surrounding environmental features include the northern mountains and the Han River to the south, which act as significant geographical barriers (Figure 63). Such geomorphological characteristics provided the ancestors of Shijiahe with a relatively enclosed and secure space. Although this topography may have presented certain inconveniences to the Shijiahe ancestors, it did not entirely isolate them from the outside world. This relatively enclosed environment may have been one of the key reasons why the Neolithic inhabitants of Shijiahe chose to settle in this region.

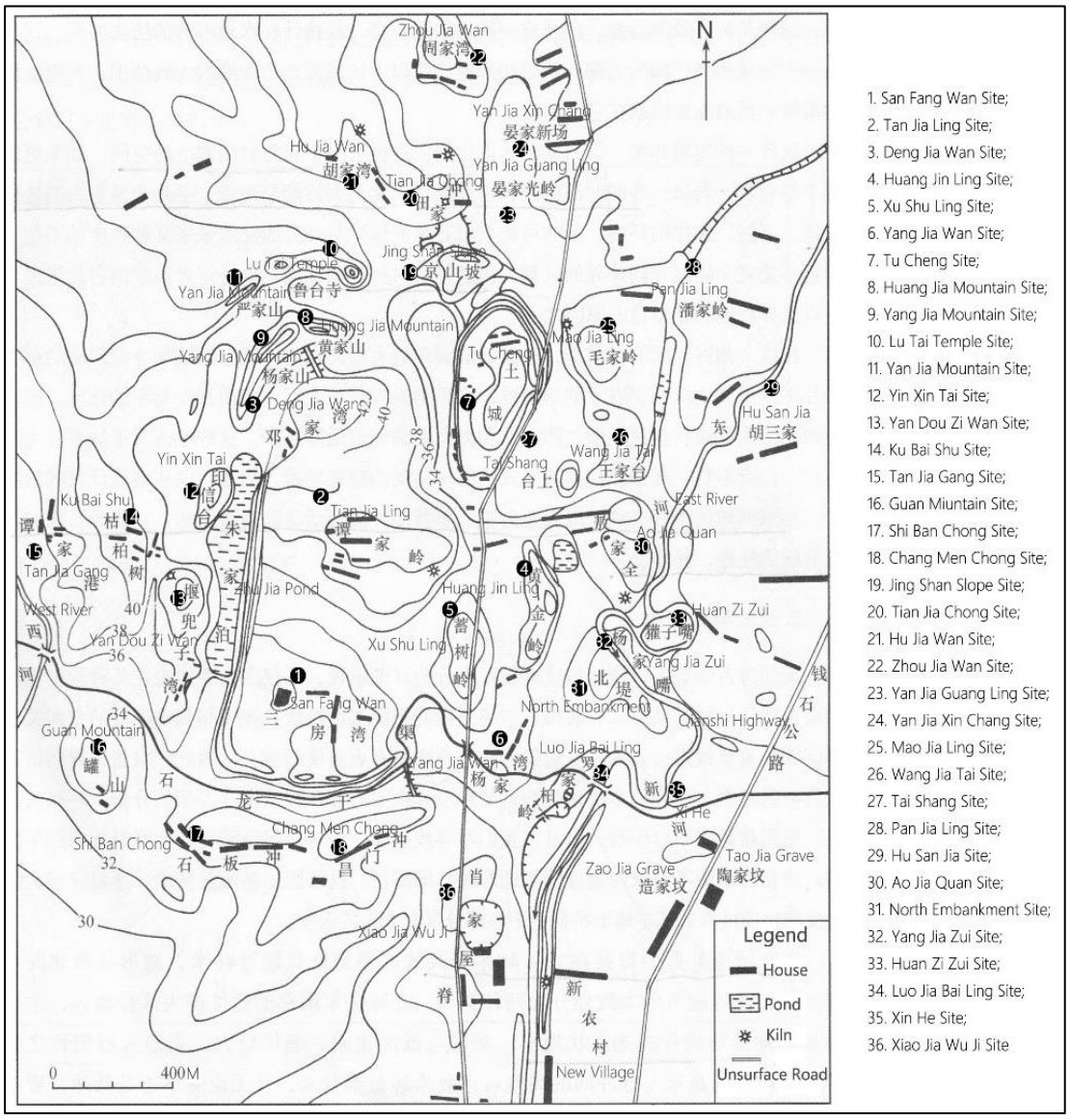


Figure 61. Micro-geomorphology and Site Distribution of the Shijiahe Settlements Site Group. (Source: recreated by the author, based on '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：8. ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 8.)

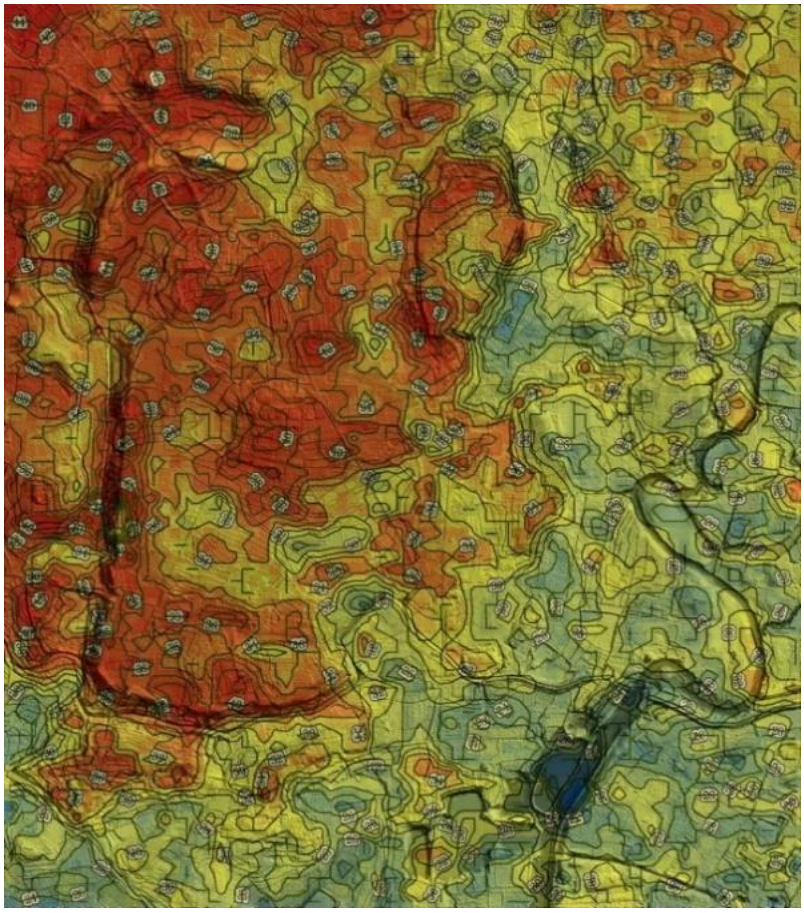


Figure 62. Elevation map of the Shijiahe Ancient Settlement Site. (Source: created by the author, use ArcMap)

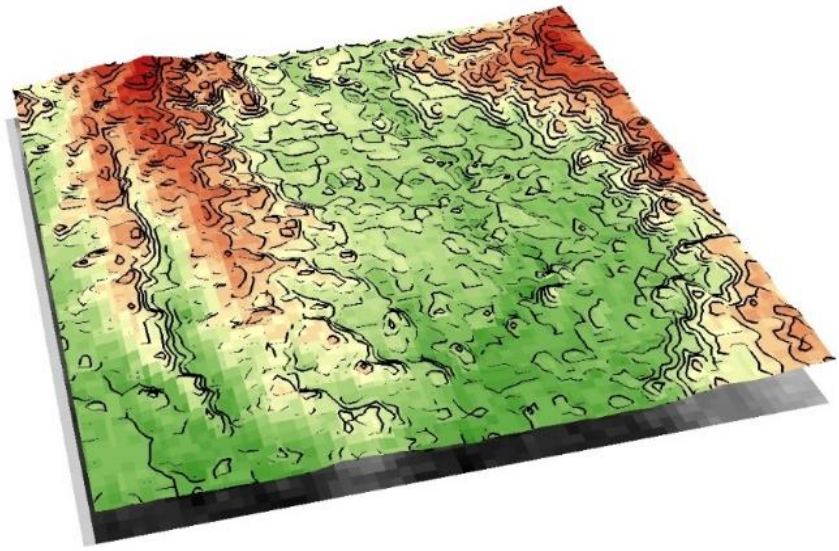


Figure 63. 3D topographic map of the Shijiahe Ancient Settlement Site. (Source: created by the author, use ArcScene)

The 36 settlements are located on a plateau that originally constituted a single extensive landform. However, during the late Neolithic period, approximately 5,000 to 4,000 years ago, the microtopography of the Shijiahe site was significantly influenced not only by natural processes but also by large-scale human activities. During this period, the construction of the Shijiahe ancient city—a major engineering project—brought about considerable changes in the local microtopography. The city walls and surrounding moats, as human-made structures, intercepted existing surface runoff and altered the natural water system. The excavation of a new circular water system further fragmented the once-continuous plateau into a disjointed geomorphological landscape (Figure 64).

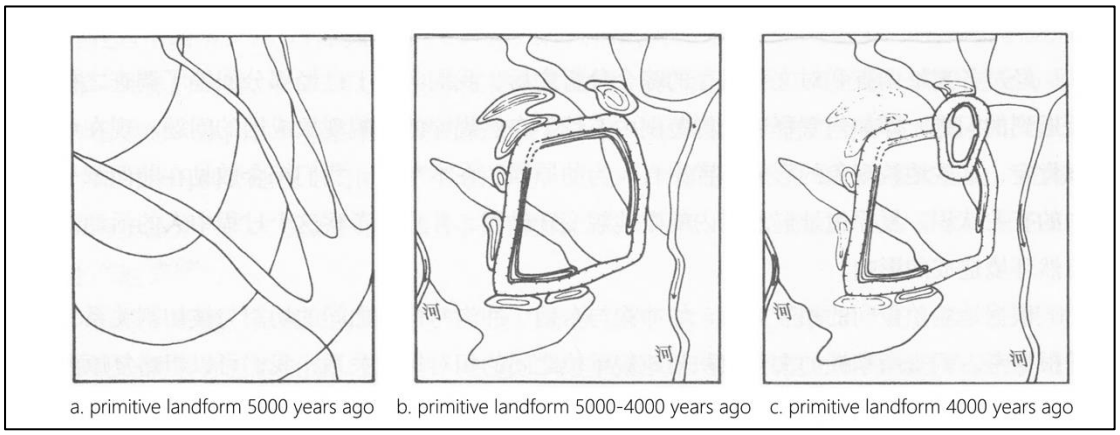


Figure 64. restoration of microgeomorphic evolution of shijiahe site group (Source: 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：98. ／Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 98.)

The Shijiahe Ancient City, the largest Neolithic settlement in the Yangtze River midstream region, is situated within an elevation range of 30 to 50 metres on the Jianghan Plain (Figure 65), in present-day Shijiahe Town, Tianmen City. The city is encircled by high walls and a surrounding moat (Figure 66). During the late Neolithic period, the total area of this settlement was approximately 1.2 million square metres. Archaeological reports estimate that the population within the city at its peak may have reached between 30,000 and 50,000 individuals. Based on a 10:1 subsistence ratio, the population engaged in agriculture in the surrounding areas is estimated to be between 300,000 and 500,000. As the population grew significantly, advancements in productivity and technology were concomitant, leading to greater material well-being. This, in turn, resulted in increased social stratification and emerging demands for spiritual fulfilment. Additionally, the Shijiahe Ancient City features a highly detailed functional zoning, including areas designated for the nobility, commoners, pottery production, burial sites, agricultural activities, and religious ceremonies (Figure 67).

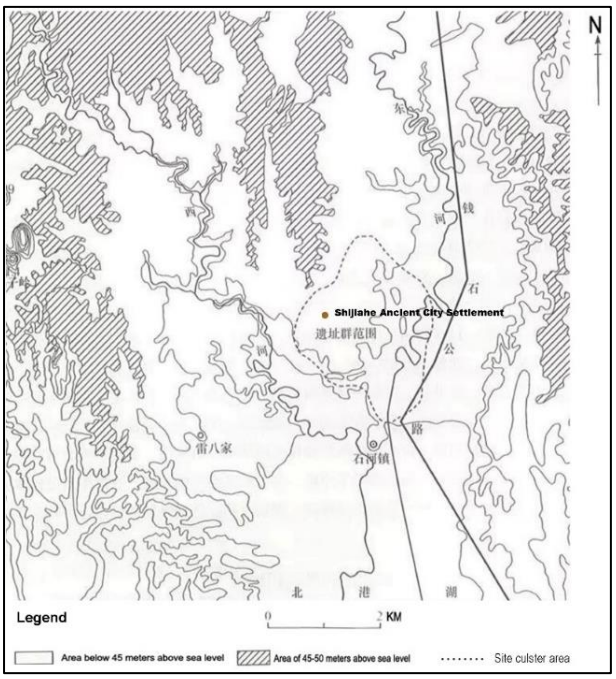


Figure 65. Location map of the Shijiahe Ancient City Settlement Site. (Source: 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology,* (00) 1993, pp. 213-294.)



Figure 66. Aerial Photograph of Shijiahe Site. (Source: captured by the author)

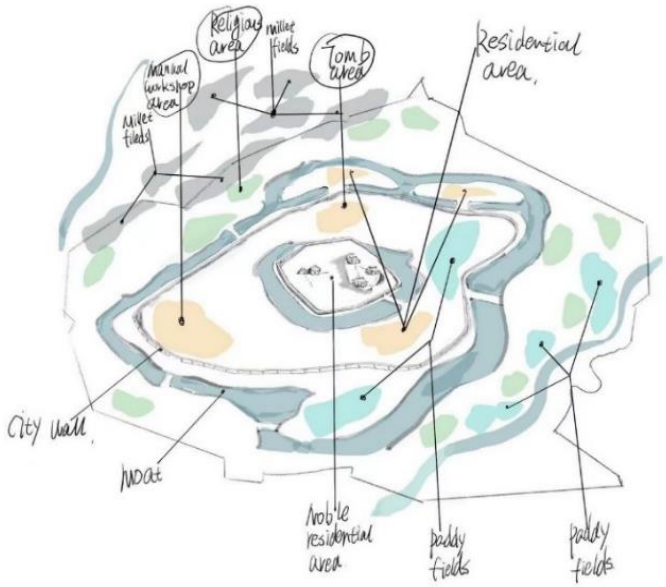


Figure 67. Shijiahe Ancient City Settlement Site Zoning Map. (Source: hand-drawn by the author, based on 北京大学考古系，湖北省文物考古研究所，湖北省荆州地区博物馆，<石家河遗址群调查报告>，*《南方民族考古》*，（00）1993，页 213-294. / A Joint Archaeology Team of Department of Archaeology, Beijing University, Hubei Institute of Cultural Relics and Archaeology, Jinzhou Museum, Hubei, 'An Investigation Report on Shijiahe Sites', *South Ethnology and Archaeology*, (00) 1993, pp. 213-294.)

Currently, the Shijiahe site is situated in Shijiahe Town, an area renowned for its rice cultivation and traditional agricultural economy. An on-site investigation of the Shijiahe Ancient City Ruins has revealed 20 modern villages. Each village is relatively small in scale, with residences typically built on slightly elevated platforms compared to the surrounding terrain.

In contrast, the archaeological findings from the Neolithic period, such as the Tanjialing site, illustrate a different scenario. Tanjialing, which is located in the central region of the Shijiahe Ancient City, covers an area of approximately 200,000 square kilometres. This site features separate city walls and moats distinct from the Shijiahe Ancient City, indicating a high-status residential area, and has yielded evidence of significant large-scale structures (Figure 68). [168]

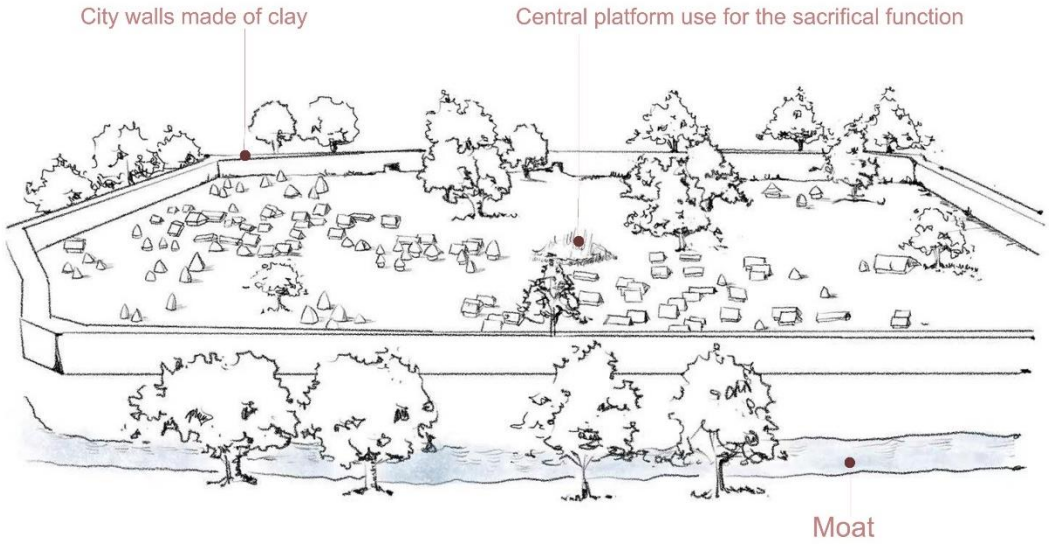


Figure 68. Reconstruction Drawing of Tanjialing Site. (Source: hand-drawn by the author, based on 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：20-22. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 20-22)

[168] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 280-281. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 280-281.



Figure 69. Aerial Photograph of Shijiahe Site. (Source: captured by the author)

Today, this modern village, which is one of the larger among the 20 contemporary villages, houses around 100 residents. It is located in the central-northern part of the archaeological terrace and occupies a relatively small area, with the majority of the surrounding land being used for agriculture (Figure 69). In comparison, the Neolithic period's architectural remains were more extensively distributed across the entire terrace, with a significantly larger number of structures and living spaces compared to the modern villages.

With the continuous increase in population, the demand for food correspondingly rises. This trend is not limited to the Tanjialing site but extends throughout the entire Shijiahe ancient city settlement area, where the majority of the soil consists of yellow-brown loam, suitable for rice cultivation. [169] Due to years of agricultural activity, the land here has been highly developed, and natural vegetation has largely been replaced by artificial plantings. In the contemporary villages within this region, the principal crops are rice, wheat, oilseed rape, and cotton. Additionally, a smaller proportion of maize,

[169] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：93. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 93

corn, legumes, sweet potatoes, and sugarcane are also cultivated. It is common to see trees planted in the front and rear of houses within these villages, predominantly fruit trees such as orange, pear, peach, and jujube. Many of these edible plants were already present and utilized during the Neolithic era, with some even being domesticated. This aspect has been addressed earlier in this chapter and will not be reiterated here.

Additionally, it is important to note that, aside from the aforementioned crops and fruits, archaeologists have uncovered a substantial number of Neolithic ceramic figurines during the excavation of the site. These figurines predominantly depict animals. Specifically, the quantity of ceramic figurines representing domesticated animals such as pigs, sheep, dogs, cattle, and chickens significantly exceeds that of other types of figurines, and their craftsmanship is notably detailed (Figure 70, 71, and 72). [170] This observation suggests a close relationship between the people of the Neolithic era and these types of animals in their daily lives. Consequently, this paper hypothesizes that the primary domesticated animals of Neolithic ancestors included pigs, chickens, ducks, and sheep, which closely resembles the current livestock structure of residents.



Figure 70. Pottery sculpture in the shape of a sheep. (Source: captured by the author)



Figure 71. Pottery sculpture in the shape of a chicken. (Source: captured by the author)

[170]王劲，<浅议石家河文化陶塑艺术>，*《华夏考古》*,4（2011），页 51-64,（第 52 页）. / Jin Wang, 'On the Art of Pottery Sculpture in the Shijiahe Culture', *Huaixa Archaeology*, 4 (2011), pp. 51-64, (p. 52).



Figure 72. Pottery sculpture in the shape of animals. (Source: Miao Yu, Prehistoric times in the middle reaches of the Yangtze River, (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 304. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020.)

Similar to the aforementioned Zoumaling Site, the Shijiahe Ancient City also features city walls and moats, with their remnants discernible through field investigations (Figure 73). As noted previously, one of the primary reasons for constructing large ancient cities during the Neolithic period was to combat flooding. The early inhabitants would typically accumulate the earth excavated during the moat construction on the inner side of the moat, thereby creating broad city walls. This suggests that in an era without artificial flood barriers, the river's volume in the Shijiahe site would have increased significantly during floods. Although modern cities no longer have moats and city walls, and such constructions might seem arduous, the ancient peoples of that distant era had no alternative but to rely on these artificial structures to protect against flooding. This need for flood defence likely contributed to the gradual emergence of moat-enclosed settlements from the mid-late Neolithic period onward.



Figure 73. Photo of the Shijiahe archaeological site. (Source: captured by the author)



Figure 74. Site photo of the Retaining Dam Remains in the City Moat of the Shijiahe Ancient City Settlement. (Source: captured by the author)

In addition to the artificial flood defence structures such as moats and city walls, remnants of water barriers have been discovered within the moats of the archaeological site (Figures 74, and 75). This distinguishes the ancient Shijiahe site from other ancient city ruins. Archaeological investigations have confirmed that these water barriers date back to the Neolithic period and were likely used for irrigation purposes. [171] This finding suggests that the inhabitants of ancient

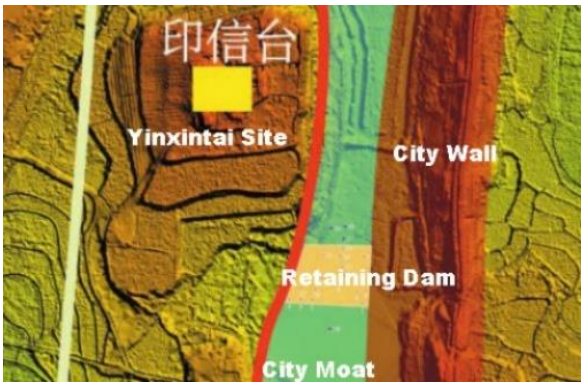


Figure 75. Illustration of the retaining dam within the city moat in Shijiahe ancient city settlement. (Source: 方勤, 赵阳, 李瑞, 王琢玺, 钟倩, 朱世乾, 昝存宝, 李晓杨, 杨宇阳，<天门石家河城址及水利系统的考古收获>，《江汉考古》，（01）2023，页 19-35，（第 32 页） / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system', *Jianghan Archaeology*, (01) 2023, pp. 19-35, (p. 32).)

[171] 方勤,赵阳,李瑞,王琢玺,钟倩,朱世乾,昝存宝,李晓杨,杨宇阳，<天门石家河城址及水利系统的考古收获>，《江汉考古》，（01）2023，页 19-35，（第 32 页） / Qin Fang, Yang Zhao, Rui Li, Qian Zhong, Zhuoxi Wang, Qian Zhong, Shiqian Zhu, Cunbao Zan, Xiaoyang Li, Yuyang Yang, 'Archaeological findings at the Tianmen Shijiahe site and its hydraulic system', *Jianghan Archaeology*, (01) 2023, pp. 19-35, (p. 32).

Shijiahe possessed the capability to manage and utilize water resources. It also provides evidence of the advanced development of agricultural civilization, particularly rice cultivation, in the Jianghan Plain during the Neolithic era.

Based on existing archaeological findings and research, it appears that the residents of Shijiahe during that period had developed a concept of family and began living in family units. In some areas, there may have been structures resembling fences, akin to modern courtyards. As previously mentioned, the Neolithic Jianghan Plain might have cultivated various edible plants, such as orange trees and Sichuan peppercorns. Consequently, it is reasonable to infer that the resourceful people of that era likely made optimal use of their land, possibly by planting fruit trees and raising small numbers of poultry within their own courtyards (Figure 76).

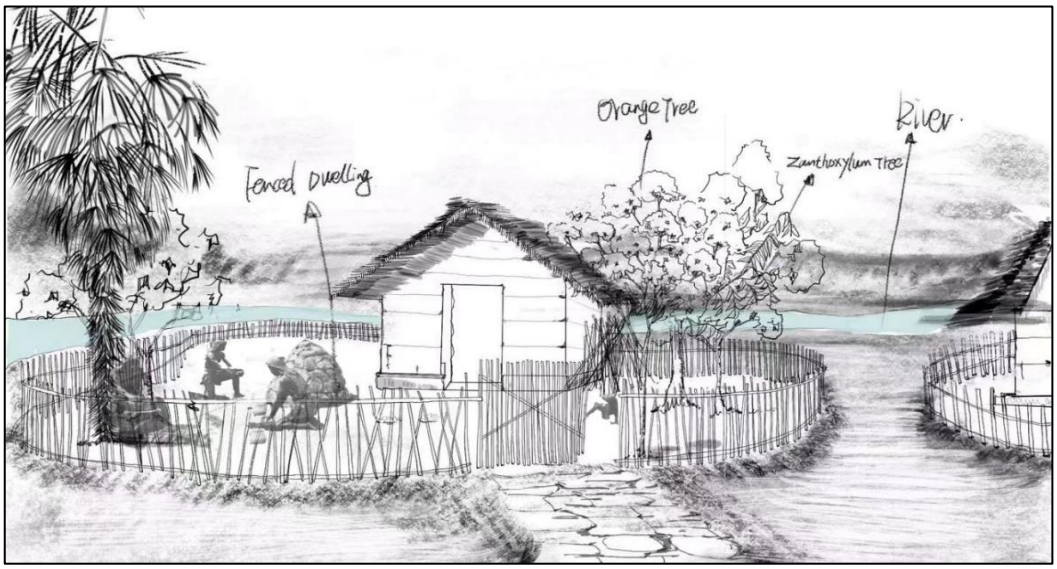


Figure 76. Reconstruction of Life Scenes in Shijiahe Ancient City Settlement. (Source: created by the author, based on 湖北省文物考古研究所编,*《湖北史前城址》*,(北京: 科技出版社, 2015), 页: 91-97. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 91-97)

In the southwestern part of the Shijiahe Ancient City, there is a site known as Sanfangwan site. The area is relatively low-lying, and field investigations have revealed the presence of a pottery kiln, a water reservoir, and earthen pits used for storing pottery

materials. This finding aligns with the accounts in the archaeological report. When archaeologists removed the surface soil, they uncovered hundreds of thousands of red pottery cups just under one metre deep, scattered across the ground in a striking display (Figure 77). However, due to the covering of soil during the excavation, only a small portion of these red pottery cups were observable during the field investigation. Archaeological research indicates that the Sanfangwan site functioned as a pottery manufacturing centre during the Neolithic period of the Shijiahe City, established in the late Qujialing Culture period and continuing in use until the end of the Neolithic era, thus spanning over 1000 years (Figure 78). [172]



Figure 77. The red pottery cups discovered at the Sanfangwan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 288-289. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), pp. 288-289.)

[172] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 280-281. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), pp. 280-281.



Figure 78. Photographs of the Sanfangwan archaeological site. (Source: captured by the author)

In addition, archaeologists have identified a distinctive area in the western section of the Shijiahe Ancient City site. This area is located on an isolated plateau outside the ancient city, which features a relatively flat top and a shape reminiscent of a seal, thus named the Yinxintai (Figure 79). It is situated adjacent to the moat of the Shijiahe Ancient City. Archaeological investigations confirm that the Seal Platform is a man-made structure, covering an area of approximately 6,000 square metres. [173] Within this space, 32 red ceramic jars, interlinked end-to-end (Figure 80), have been discovered, some of which bear enigmatic symbols, potentially indicating their use as ritualistic vessels. Review of archaeological reports suggests that this site served as a large ritual space, commonly hosting ceremonial activities and functioning akin to a 'temple' during the late Shijiahe culture period. The Seal Platform site represents the largest Neolithic ritual site discovered to date in the middle Yangtze River region. Its discovery highlights that the Shijiahe Ancient City was a distinctive urban settlement in the middle Yangtze River area, potentially holding a status comparable to a regional 'capital.'

[173] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 287. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 287.

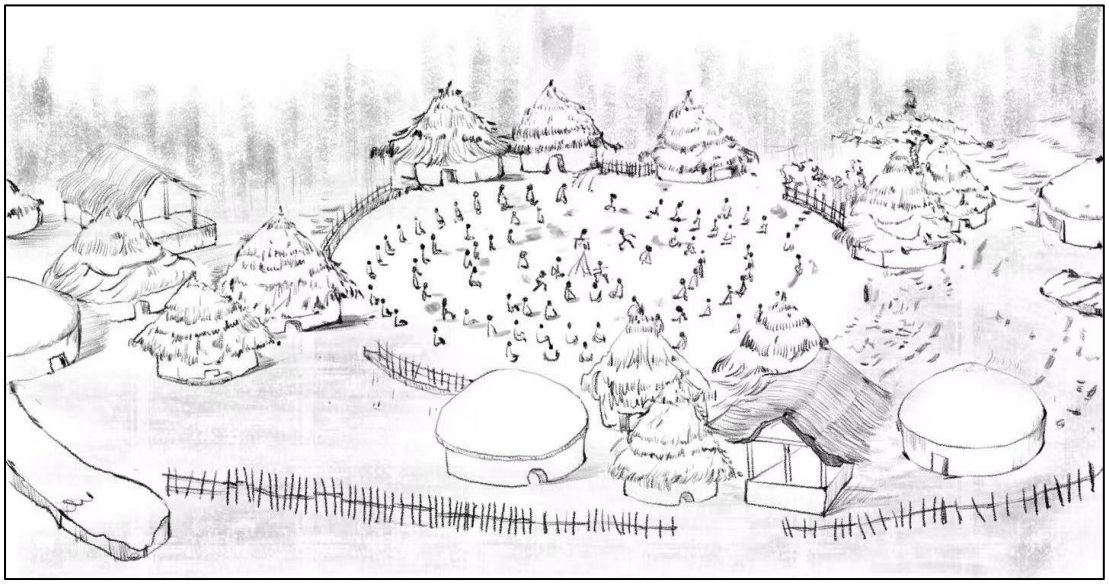


Figure 79. Speculative visual representation of the Yinxintai Site in the Shijiahe Ancient Settlement Site. (Source: hand-drawn by the author, based on 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：40-42. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 40-42)



Figure 80. The Yinxintai archaeological excavation site. (Source: captured by the author)

Residential buildings within settlements

In addition to the aforementioned aspects, residential structures are also among the most significant human-made landscapes. Unlike the Palaeolithic era, during which human societies were predominantly nomadic, the advent of agriculture in the Neolithic period led to permanent settlement. Consequently, people began constructing dwellings using materials such as clay, wood, and stone, which enhanced their stability and durability, thereby providing better resistance to environmental conditions. Architectural designs during this period also evolved to emphasize long-term usability and comfort, resulting in more complex housing structures with clearly defined zones, such as living areas and

storage spaces. The diversity of forms and functions of these dwellings expanded to include purposes beyond mere habitation, such as food storage and tool storage. [174]

Evidence of housing construction in the Jianghan Plain during the Neolithic period is relatively scarce, though not entirely absent. At the Guanmiaoshan site from the early Neolithic period (Daxi Culture), the archaeological report reveals a floor plan (Figure 81) indicating that residential buildings from the Daxi Culture were square in shape. The inhabitants levelled the ground and excavated varying numbers of post holes for the construction of the building framework (Figure 82), which were then filled with rough wooden posts (Figure 83). The floors inside the structures were covered with multiple layers of fired earth and clay for moisture protection. This is supported by the discovery of small segments of straw mixed within the clay and fired earth debris during the excavation process. [175]

[174] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020） / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020).

[175] 李文杰, 沈强华, 任式楠，<湖北枝江关庙山遗址第二次发掘>，*《考古》*, 1 (1983) ，页 17-29，（第 16 页）. / Wenjie Li, Qianghua Shen, Shinan Ren, 'Second Excavation of the Guanmiaoshan Site in Zhijiang, Hubei', *Archaeology*, 1 (1983), pp. 17-29, (p. 16).

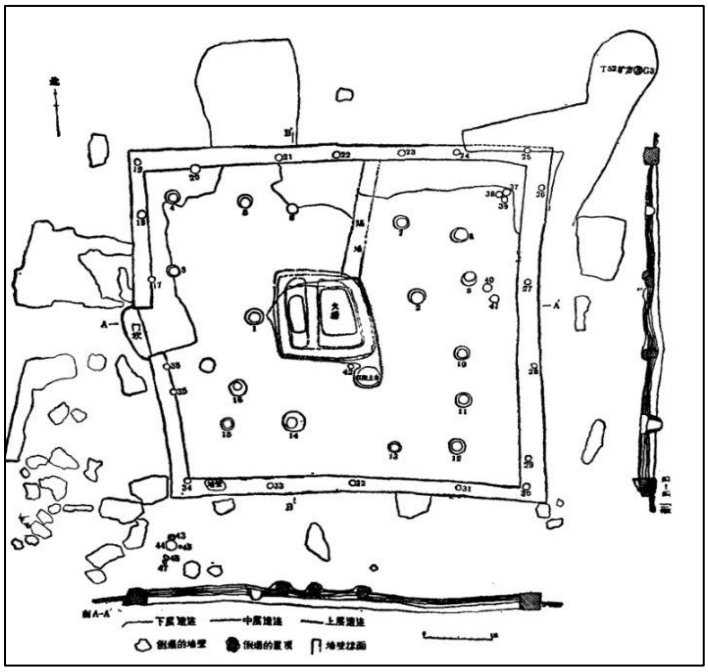


Figure 81. Floor Plan of House Remains (F22) at the Guanmiaoshan Site. (Source: 李文杰，沈强华，任式楠，〈湖北枝江关庙山遗址第二次发掘〉，*《考古》*，1（1983），页 17-29. / Wenjie Li, Qianghua Shen, Shinan Ren, 'Second Excavation of the Guanmiaoshan Site in Zhijiang, Hubei', *Archaeology*, 1 (1983), pp. 17-29.)



Figure 82. Panoramic View of the House Remains (F30) in the Guanmiaoshan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 170. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 170.)

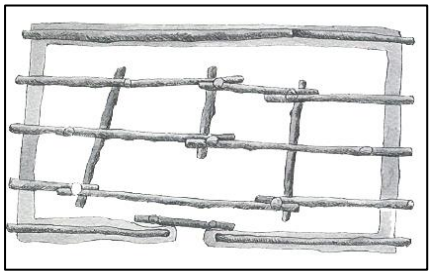


Figure 83. Restoration of the wooden frame of the house. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 171. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), p. 171.)

Through an on-site investigation at the Guanmiaoshan site, it was observed that there is an approximately 60-centimetre gap between two adjacent pillar holes around the perimeter of the structure. Examination of the archaeological report revealed that this area corresponds to the wall structure. [176] To prevent wall collapse during construction, the ancients reinforced the building by digging a trench for the wall foundation. In the central area of the building, there is a rectangular mound structure (Figure 84). The archaeological report indicates that this was used as a hearth for heating, suggesting that it may have served not only as a place for warming but also potentially as a dining area for the inhabitants. Adjacent to the hearth, there is a clearly elevated area paved with red-burned earth, which archaeologists have identified as the living area within the house, analogous to a modern bed. Additionally, in the southwestern part of the house ruins, there is a facility constructed from red-burned earth blocks. [177] Based on its location and shape, it is hypothesized to be part of the building's drainage system, a conclusion that has been corroborated by the archaeological report. This feature represents a long-standing housing accessory designed to prevent rainwater from eroding the building's foundation.

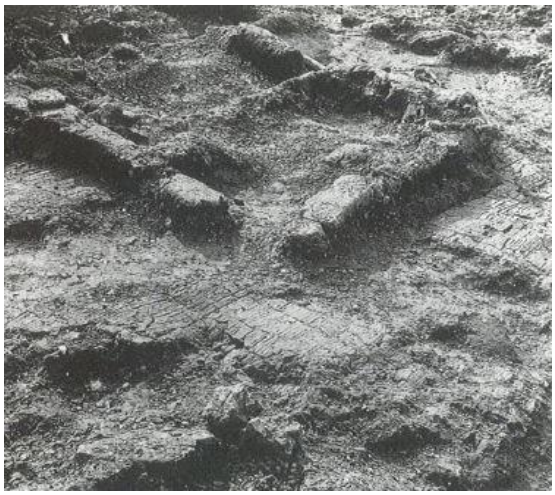


Figure 84. The fire pit located within the remnants of the dwelling at Guanmiaoshan Site. (Source: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 172. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 172.)

[176] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 172. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 172.

[177]李文杰，沈强华，任式楠，<湖北枝江关庙山遗址第二次发掘>，*《考古》*，1 (1983) ，页 17-29，（第 16 页）/ Wenjie Li, Qianghua Shen, Shinan Ren, 'Second Excavation of the Guanmiaoshan Site in Zhijiang, Hubei', *Archaeology*, 1 (1983), pp. 17-29, (p. 16).

In addition, the Mengbanwan site (门板湾遗址), located at the northern edge of the Jianghan Plain, preserves a nearly complete set of earthen-structured houses. Archaeologists have determined that these structures were constructed during the Middle to Late Neolithic period, specifically within the Qujialing culture. [178] This particular house remains are chronologically later than those at the Shangguan Miao Mountain site. Furthermore, compared to other house remains, this nearly intact large house provides more detailed information for this paper (Figure 85).



Figure 85. Architectural remnants of Neolithic dwellings at Menbanwan Site. (Source: 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 33. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 33)

The dwelling is oriented with a southern exposure and consists of a sequence of four contiguous rooms and a separate individual room. [179] All the doors within the building employ mortise and tenon joinery, with widths ranging between 75 to 80 centimetres,

[178] 李桃元，<应城门板湾遗址大型房屋建筑>, *《江汉考古》*，01（2000），页 96 / Taoyuan Li, 'Large residential buildings at the Yingcheng Menbanwan site', *Jianghan Archaeology*, 01 (2000), p. 96.

[179] 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：306-307. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 306-307.

comparable to modern door dimensions. According to the architectural layout (Figure 86), the four adjacent rooms are connected by a corridor, which significantly enhances the privacy of the occupants, suggesting that these rooms likely served as the primary living spaces. The smaller rooms on either side may have been used as a kitchen or for other specific functions. The relatively isolated room could have functioned as a storage area or a space for the housing of livestock.

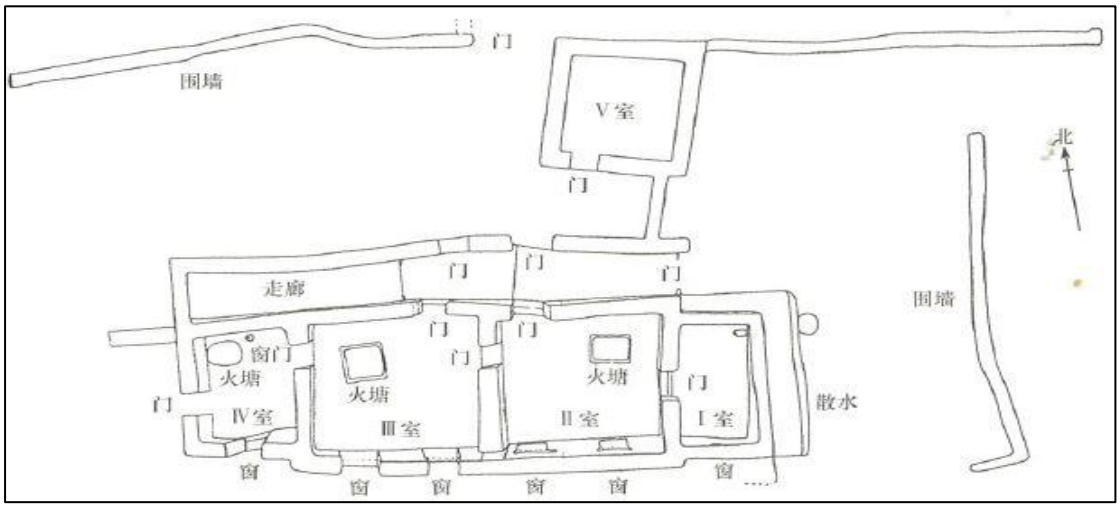


Figure 86. Floor plan depicting the architectural remnants of residential structures found at the Menbanwan Archaeological Site. (Source: recreated by the author, based on '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页 308. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. 308.)

Furthermore, archaeologists have discovered that the house in question was constructed within a courtyard approximately 400 square metres in size. [180] This feature distinguishes it from another house remains in the Menbanwan site and the Jianghan Plain. In contemporaneous Yangshao culture settlements in the Central Plains, courtyards were a common component of residential architecture. These courtyards were typically used for daily production activities, such as food processing and craft-making. Therefore, it can be inferred that the courtyard at the Menbanwan site may

[180] 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 258. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River,* (Wuhan: Wuhan University Press, 2020), p. 258.

have included planned landscapes, such as fruit tree plantations, poultry farming, and small-scale agriculture—elements with practical utility (Figure 87).

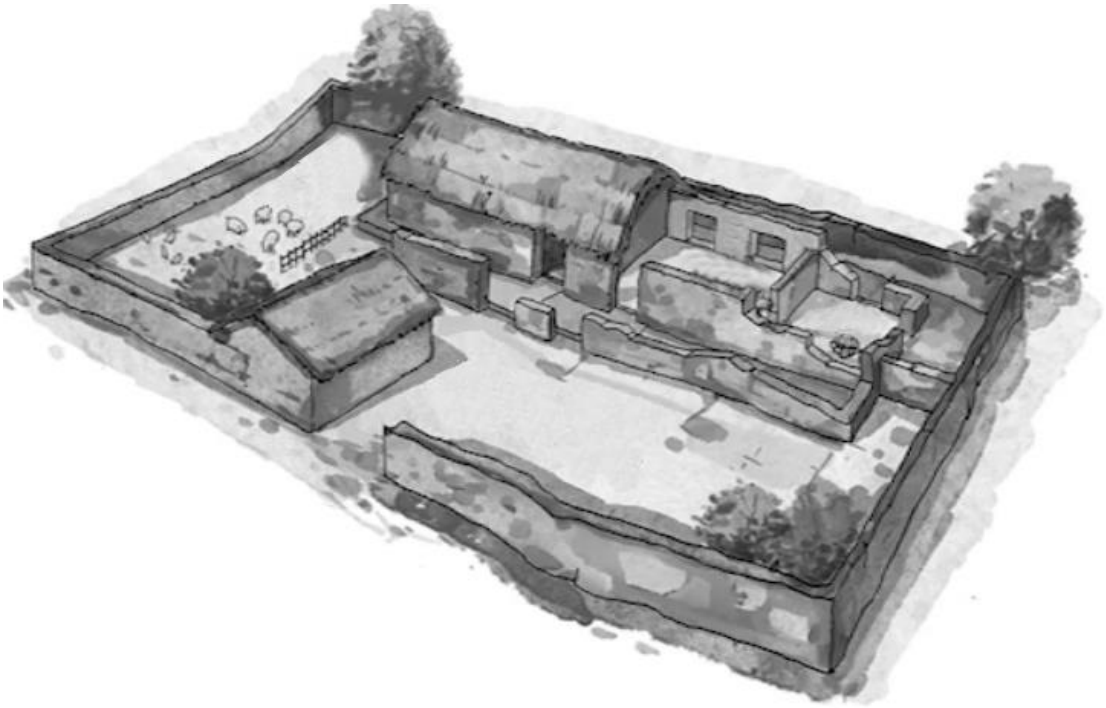
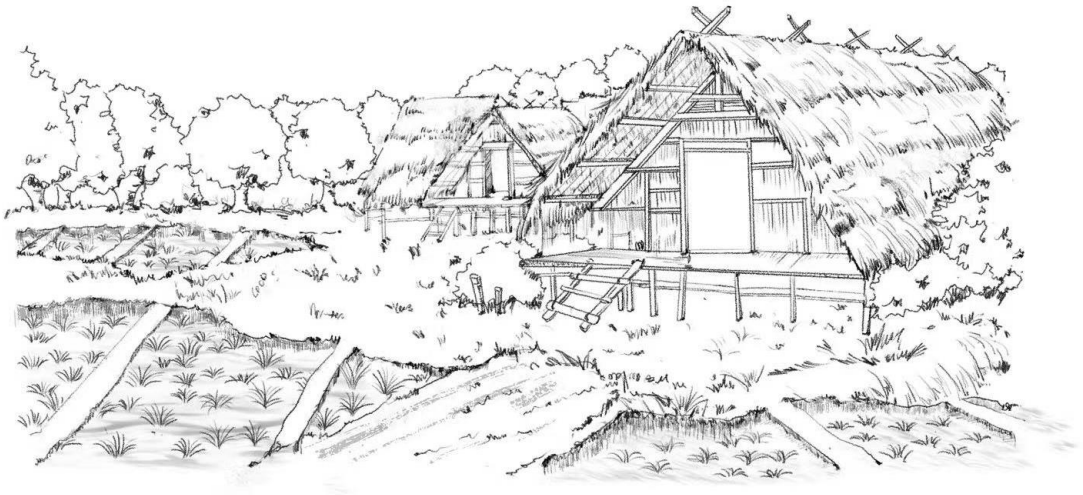


Figure 87. Hand-drawn Reconstruction of Houses at the Menbanwan Site (Source: recreated by the author, based on: 于淼，*《长江中游的史前时代》*，（武汉：武汉大学出版社，2020），页 257-263. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River*, (Wuhan: Wuhan University Press, 2020), pp. 257-263.)

This discovery resonates with the earlier discussion of family courtyards in the Shijiahe ancient city. Given that the Shijiahe culture period is later than the Qujialing culture period, it is reasonable to hypothesize that the functional organization of houses and courtyards at the Shijiahe site may have been similar to or even more advanced than that at the Menbanwan site. Additionally, although the courtyard's artificial landscapes at this time cannot be considered true private gardens, the architectural remains at the Menbanwan site reflect an early interest among Neolithic residents of the Jianghan Plain in modifying their living environments. This development can be attributed to the relative stability and security of the society, which facilitated technological advancements and ensured ample resources, leading to an increased pursuit of residential comfort.

In addition to the architectural sites previously identified through archaeological research, it is possible that other building types remain undiscovered. As discussed in the section on settlement patterns, the Neolithic period not only featured walled settlements but also included dispersed rural settlements. Figure 41 in the previous text illustrates that several settlements exist around the ancient Shijiahe city, many of which exhibit a dispersed residential pattern. The spatial separation between these settlements might have necessitated a self-sufficient lifestyle among their inhabitants. Evidence from comparable sites, such as the Liangzhu culture remains, indicates that small settlements were dispersed around agricultural fields, with archaeological finds revealing irrigation ditches and dams in proximity to residential structures. [181] This suggests that fields were likely located near residences and that several households might have shared one or more plots of land, reflecting a pattern similar to that of contemporary village life in the region (Figure 88).



[181]长江文明馆编，*《长江中游地区新石器时代的人地关系研究》*，（武汉：长江出版社，2015），页 135. / Yangtze River Civilization Museum, *Study of Human-Environment Relationships in the Middle Yangtze River Region During the Neolithic Era*, (Wuhan: Changjiang Press, 2015), p. 135.

Figure 88. Speculative Reconstruction Map of Residents' Living Scenes Beyond the Shijiahe Ancient City Settlement. (Source: hand-drawn by the author, based on 湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：40-42. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), pp. 40-42)

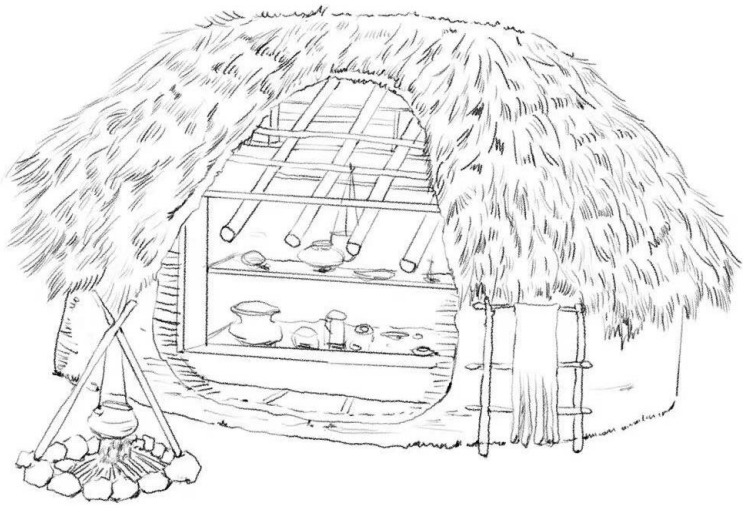


Figure 89. Speculative visual representation of a storage within the archaeological site of the Shijiahe ancient city settlement. (Source: recreated by the author, based on: 于淼，《长江中游的史前时代》，（武汉：武汉大学出版社，2020），页 139. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River, (*Wuhan: Wuhan University Press, 2020), p. 139.)



Figure 90. Speculative visual representation of storage and pit within the archaeological site of the Shijiahe ancient city settlement. (Source: created by the author, based on '于淼，《长江中游的史前时代》，（武汉：武汉大学出版社，2020），页 139. / Miao Yu, *Prehistoric times in the middle reaches of the Yangtze River, (*Wuhan: Wuhan University Press, 2020), p. 139.)

Simultaneously, the storage of grains and food represents an essential functional requirement in the daily lives of residents. According to archaeological reports and various historical records, the early inhabitants of Shijiahe during the Neolithic period employed two primary methods for food storage: one involved storing food within their residences or constructing 'storage rooms' adjacent to their dwellings (Figure 89); the other method entailed digging pits in the land beside their houses and storing food directly within these pits (Figure 90).

In addition to buildings primarily used for residential and storage purposes, there exists a distinct category of architectural relics mentioned earlier— Yinxintai site. Although these differ from the more common functional structures such as residential or storage buildings, seal platforms possess certain architectural characteristics as they represent consciously planned, constructed, and utilized sites. These platforms feature a defined layout and structure, constructed with elements such as artificially piled loess

foundations, and were employed in specific ritual activities during the Neolithic period. They also reflect aspects of the social organization, religious beliefs, and engineering capabilities of the time. Thus, it is evident that people of the Neolithic era not only exhibited social organizational skills, architectural techniques, and economic productivity but also engaged in a rich spiritual and cultural life.

Conclusion

In summary, this chapter employs an analysis of archaeological literature to hypothesize the origins of agriculture during the Neolithic period, examining the agricultural landscapes characterized by rice paddies and irrigation systems. Additionally, it conducts a comparative analysis of pollen analysis results from various archaeological studies to identify other edible plants that were available to early inhabitants of the Jianghan Plain during the Neolithic. Utilizing Geographic Information Systems (GIS), the chapter delineates the distribution of settlement sites and, in conjunction with the flotation results of charred plant remains, infers the agricultural patterns of the Neolithic era. Furthermore, GIS analysis reveals that the inhabitants of the Jianghan Plain constructed a distinctive land network along ridge lines, facilitating an investigation into the possible criteria used by early humans in site selection. This study ultimately indicates that during this period, humans not only adapted to their natural environment but also learned to optimize the utilization of environmental resources, marking the beginning of a harmonious relationship between natural and cultural landscapes.

In the field of agriculture, the Neolithic period in the Jianghan Plain saw the gradual development of agricultural practices, with humans beginning to cultivate land and grow crops. During this period, major crops included rice and millet. The cultivation of these crops not only provided sustenance but also reflected the extent to which humans adapted to and modified their environment. The emergence of rice paddies transformed

the original natural landscape, creating a distinct agricultural landscape. Although no farming relics have been excavated in the Jianghan Plain, a significant number of rice remains have been discovered at Neolithic sites across the region. Additionally, at the Chengtoushan site on the Liyang Plain, located just 100 kilometres from the Jianghan Plain, Neolithic rice paddy remains have been found. Given the similarities in geography and climate between the Jianghan and Liyang Plains, the characteristics of the rice paddy remains at Chengtoushan can be inferred to reflect those of prehistoric rice paddies in the Jianghan Plain. Furthermore, rice paddy remains found at the Maoshan site in Hangzhou, dating to the Liangzhu Culture of the Neolithic era, provide additional clues. Situated in the lower Yangtze River region, the Maoshan site shares geographical and ecological similarities with the Jianghan Plain in the Yangtze River's mid-stream area. The information from these sites suggests not only the agricultural landscape of the Jianghan Plain during the Neolithic period but also a broader agricultural landscape across the Yangtze River basin during the same era, likely exhibiting high degrees of similarity. For instance, rice, rather than millet, was predominantly cultivated, with rice paddies being relatively small and irregular in shape. Additionally, people of the time began to construct irrigation infrastructure, such as ditches and wells, to support crop growth. The development of these irrigation systems enhanced agricultural efficiency and reflected contemporary technological and organizational capabilities. In contrast, modern rice paddies in the same region are larger, more systematically planned, and typically rectangular or square in shape.

During this period, settlements within the Jianghan Plain predominantly clustered along ridge lines, situated in elevated areas that were less susceptible to flooding and offered convenient transportation routes. For instance, the Chengbeixi Culture and Daxi Culture sites are predominantly distributed in a roughly circular pattern around the periphery of the Jianghan Plain. Over time, the number of settlements began to increase dramatically; however, the quantity of settlements within the interior of the plain remained relatively limited, with the majority of archaeological sites still located at the

edges of the Jianghan Plain. Prior to the mid-Neolithic period, settlements were primarily located in high-altitude regions surrounding the Jianghan Plain, exhibiting a pattern of small, dispersed habitation. Each settlement in this model operated independently with a limited population capacity, and the distances between different settlements were generally considerable. By the late Neolithic period, as communities began to establish longer-term habitation in areas less threatened by flooding, a pattern of collective settlement emerged in certain regions. This collective settlement model comprised both city-walled settlements and central settlements, with the former including essential urban components such as city walls and ramparts. The central settlement model not only encompassed city-walled settlements but also served as the hub among multiple settlements. To adapt to the surrounding environment, early inhabitants had developed preliminary methods for managing and utilizing water resources within their natural environment. For example, in the settlements of Zhaomaling and Shijiahe, they constructed water-retention dams to intercept rivers, thus modifying their environment and regulating water resources to create conditions conducive to both habitation and agricultural cultivation.

Agriculture predominantly centred around rice cultivation began to emerge. In regions abundant in water and land resources, residents strategically arranged the locations of rice fields according to the topography, selecting lower-elevation plain wetlands for agriculture while ensuring that residential areas were situated at higher elevations. This led to a spatial organization within settlements where habitation occurred in elevated zones, while agricultural and aquaculture activities took place in the low-lying areas. In daily life, individuals likely utilized ridge lines to facilitate cultural exchange and trade among settlements. During instances of flooding, these interconnected ridge lines served as safe passageways for the population to evacuate.

In terms of residential architecture, Neolithic-period dwellings in the Jianghan Plain

were primarily surface-level constructions. People opted to build houses directly on the ground, and the structure and forms of these buildings exhibited greater diversity compared to the Palaeolithic era. Additionally, some large moated settlements featured public buildings such as ritual spaces and assembly areas. The emergence of these public structures reflects a certain degree of advancement in social organization and collective awareness at that time, alongside improvements in production capabilities. Consequently, the overall standard of living during the Neolithic period was significantly higher than in the Palaeolithic era.

Furthermore, the methods by which people obtained food underwent significant changes. Unlike the Palaeolithic era, which relied on foraging and hunting for naturally available resources, the Neolithic era marked the advent of agriculture and animal domestication. For instance, Neolithic societies not only began cultivating rice but also initiated the domestication of animals such as chickens, dogs, and pigs, leading to a more stable food supply. As a result, human societies transitioned from a nomadic to a settled way of life, establishing permanent villages and communities. However, it is important to recognize that people of that time were still highly dependent on natural conditions such as land, water sources, and climate. Specifically, while Neolithic communities opted to cultivate crops in regions with fertile soil and abundant water, those in the Yangtze River basin focused on rice cultivation, whereas those in the Yellow River basin grew millet and sorghum. Thus, these agricultural choices were largely influenced by local natural conditions, reflecting an ongoing adaptation to nature. Consequently, it can be inferred that regardless of the era—whether Palaeolithic or Neolithic—human societies remained deeply reliant on natural resources, and their impact on the environment, although present, was still relatively limited.

Overall, the landscape of the Jianghan Plain during the Palaeolithic era was predominantly in a state of natural evolution, with human impact on the environment

remaining relatively minimal. Although human activities did not significantly alter the landscape, they began to exert preliminary effects on the region's natural state. By the Neolithic period, with population growth and advancements in production technology, humans began to progressively transform the surrounding natural environment. Consequently, under the combined influence of human activities and natural factors, new changes began to emerge in the landscape of the Jianghan Plain.

Chapter 4. The Bronze Age: Emergence of Diverse Landscapes in Cultural Integration

Regarding the conclusion of the Neolithic period, some scholars suggest that around 2000 BCE, the Jianghan region experienced a decline in human civilization.[182] This phenomenon is evidenced by a significant reduction in the number of human sites over the subsequent centuries, with only a few remaining by the end of the period. Some scholars attribute this decline to the environmental conditions of the time, possibly involving climate changes that led to widespread flooding.[183] According to this perspective, it can be taken that most human sites on the Jianghan Plain during the late Shijiahe culture period gradually submerged by the expanding ancient Yunmengze Lake group, forcing humans to relocate to higher elevations, thus leading to the disappearance of these sites.

Other scholars propose that this phenomenon was due to political reasons, particularly wars between the 'Huaxia' (华夏) people from the Central Plains and the indigenous inhabitants of the Jianghan Plain.[184] According to tradition, the ruler of the Central Plains, 'DaYu' (大禹), led a coalition army into the heartland of the Sanmiao (三苗) tribes in the Jianghan Plain and captured the ancient city of Shijiahe. Archaeological research indicates severe damage to the city walls, providing evidence of intense warfare. The fall of Shijiahe marked a decisive victory for 'DaYu' (大禹) over the Sanmiao (三苗) tribes.

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[182] Rowan K. Flad, 陈伯桢, *《古代中国内陆》*, (北京：北京联合出版公司，2021), 页 166. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021), p. 166.

[183] 严文明，<略论中国文明的起源>,*《文物》*，1（1992），页 40-49（第 42-43 页）. / Wenming Yan, A Brief Analysis of Chinese Civilization's Origins, *Cultural Relics*, 1 (1992), 40-49 (pp. 42-43).

[184] 严文明，安田喜宪，*《稻作、陶器和都市的起源》*，（北京：文物出版社，2000）,页 189-197. / Wenming Yan, Yoshinobu Yasuda, *The Origins of Rice Cultivation, Pottery, and Urbanization*, (Beijing: Cultural Relies Press, 2000), pp. 189-197.

These two viewpoints are not mutually exclusive; this thesis argues that they, along with other factors, can collectively explain the fundamental reasons for the transition from the Neolithic to the Bronze Age. All these factors had a profound impact on the landscape characteristics of the Jianghan Plain during the Bronze Age. The combined effects of warfare and natural disasters may have led to the near-destruction of Neolithic civilization in the Jianghan Plain and the emergence of a cultural hiatus over the following centuries. This paper describes the transition into a new era—the Bronze Age.

The Bronze Age as discussed in this chapter refers to the period from around 2000 BCE to the end of the Qin Dynasty in 221 BCE. The starting point of the Chinese Bronze Age remains a subject of debate among scholars. Kwang-chih Chang, a member of the National Academy of Sciences of the United States, posits that the onset of the Chinese Bronze Age occurred no later than 2000 BCE, with its conclusion being a gradual process. Although it began in the late Spring and Autumn period, it was not fully completed until the beginning of the Qin Dynasty. [185] According to current archaeological data, the Chinese Bronze Age lasted at least 1500 years. Despite overlapping with the Iron Age by several centuries towards its end, the development of bronze civilization in the Jianghan Plain was comparatively less advanced than in the Central Plains, and the widespread use of iron did not occur until the Han Dynasty. This paper aligns with Kwang-chih Chang 's definition of the chronological span of the Bronze Age as outlined in his work *The Bronze Age of China*, including the Warring States period within the Bronze Age. This chapter will examine the period from the end of the Neolithic era, starting around 2000 BCE, to the end of the Qin Dynasty, covering a total duration of over 1700 years.

[185] 张光直，*《中国青铜时代》*，（北京：生活.读书.新知三联书店，1982），页 3. / Kwang-chih Chang, *The Bronze Age in China*, (Beijing: SDX Joint Publishing Company, 1982), p. 3.

Introduction

During the Bronze Age, significant changes in the landscape of the Jianghan Plain resulted from a complex interplay of social, economic, and cultural transformations. The Bronze Age in the Jianghan Plain began with the emergence of the 'Erlitou culture' (二里头文化) in the Central Plains, approximately from 2000 BCE to 1500 BCE, representing the early phase of the Bronze Age. During this period, communities primarily based in the Shijiahe settlement in the northern part of the Jianghan Plain migrated northward, leading to the decline of the once-flourishing Shijiahe culture.[186]

In their study of the early Bronze Age, archaeologists have focused predominantly on the Central Plains, with comparatively limited attention given to the Jianghan Plain in the middle reaches of the Yangtze River, which did not yield as many archaeological discoveries as the Neolithic era.[187] For a long time, the Hubei region remained largely unexplored in terms of archaeological findings from the Xia dynasty. However, starting from the mid-Bronze Age, specifically the Shang dynasty, archaeologists have uncovered several human settlements in the Jianghan Plain, including the Jingnan Temple site, the Zhouliang Yuqiao site, and the Panlongcheng site, among other Shang dynasty cultural sites. Among these, the Panlongcheng site is of particular significance as it is an approximately 3500-year-old Shang dynasty city.[188] It is noteworthy that most of the sites discovered in the Jianghan Plain are closely related to the Erlitou and Erligang cultures of the Central Plains, and Panlongcheng is no exception. Contemporary archaeologists generally consider Panlongcheng to be a transitional

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[186] 鲁西奇,《区域历史地理研究-对象与方法：汉水流域的个案考察》,（北京：社会科学文献出版社，2019），页 115-116. / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), pp. 115-116.

[187] Rowan K. Flad, 陈伯桢, 《古代中国内陆》, (北京：北京联合出版公司，2021), 页 166. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021), p. 166.

[188] 杨宝成,《湖北考古发现与研究》,（武汉：武汉大学出版社，1995），页 73. / Baocheng Yang, *Archaeological Discoveries and Research in Hubei Province*, (Wuhan: Wuhan University Press, 1995), p. 73.

point through which Central Plain civilization spread to the Yangtze River basin. The migration of populations and cultural integration inevitably altered the regional landscape of the Jianghan Plain, making the study of the distinctive features of the Panlongcheng site a focal point of this chapter.

It is important to note that at the outset of the Bronze Age, China witnessed a centripetal cultural trend centred around the Central Plain region, which gradually established a structure of cultural diffusion. Archaeological reports reveal that, in terms of settlement patterns and cultural configurations, the Erlitou and Erligang sites, both located within the Central Plain area of Henan Province, exhibit characteristics of state-level organization.[189] Over time, political and cultural connections between different regions became increasingly integrated, with some archaeologists hypothesizing that these sites might have served as the capitals of the Xia and Shang dynasties respectively.

The Spring and Autumn and Warring States periods of the Eastern Zhou Dynasty mark an era of expansion for the State of Chu, situated in the later stages of the Bronze Age. During this time, Chu underwent rapid expansion, extending its influence to the southern regions of China. At the height of its power, Chu's territory expanded from what is now Hubei Province to the Lingnan region of Guangdong Province. The origins of the State of Chu can be traced back to ancient times. According to ancient texts such as the *Zuo Zhuan (《左传》)* and the *Records of the Grand Historian (《史记》)*, the ancestors of Chu were believed to be descendants of the Zhu Rong lineage, which resulted from the amalgamation of the San Miao (三苗) tribe from the Jianghan region and migrants from the Central Plains. The San Miao tribe was a significant group in ancient southern China, predominantly located in present-day Hunan, Hubei and

[189] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 1. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), p. 1.

surrounding areas. They were among the indigenous peoples of the Yangtze River's middle and lower reaches and played a crucial role in the cultural and social development of the region. 'Rong Zhu' (祝融), a deity in ancient Chinese mythology representing fire and light, was linked to this group. [190] [191] His descendants maintained connections with the Central Plains and migrated southward to the Chu territory during the mid-Bronze Age. This migration and integration process likely symbolized the fusion of Central Plains culture with the indigenous southern culture. [192]

In its early development, the culture and social structure of the Chu state exhibited the influence of Central Plain culture as well as the distinctive characteristics of southern regional cultures. This feature of cultural amalgamation is markedly evident throughout the history and culture of Chu. The state of Chu's rise from a regional tribal society to a major power during the Spring and Autumn and Warring States periods can largely be attributed to its open and inclusive cultural policies.[193] During its migration and expansion, the people of Chu engaged in exchanges and integrations with various neighbouring ethnic groups and tribes, incorporating elements of Central Plain culture and blending with the diverse cultures of the southern regions.

As a core area of the Chu Kingdom, the Jianghan Plain has yielded a substantial number of archaeological sites related to the Chu Kingdom and the Eastern Zhou Dynasty, including the ruins of one of the former capitals of the Chu Kingdom, the Jinan City site. In addition to this site, the Jianghan Plain also features a royal settlement outside of the capital, known as the Longwan site (龙湾遗址). Located within the ancient

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[190] 左丘明（春秋），*《左传》*. / Qiuming Zuo (Spring and Autumn Period), *Zuo Zhuan*

[191] 司马迁（汉），*《史记》*. / Sima Qian (Han Dynasty), *Records of the Grand Historian*.

[192] 张正明，刘玉堂，*《湖北通史-先秦卷》*，（武汉：华中师范大学出版社，1999），页 167-172. / Zhengming Zhang, Yutang Liu, *General History of Hubei: The Pre-Qin Volume,* (Wuhan: Central China Normal University Press, 1999), pp. 167-172.

[193] 刘玉堂，*《楚脉千秋》*，（武汉：华中师范大学出版社，2020），页 42-43. / Yutang Liu, *Thousands of Years of Chu Culture,* (Wuhan: Central China Normal University Press, 2020), pp. 42-43.

Yunmengze Lake cluster, this is part of a large royal garden. Archaeologists have uncovered numerous remains of palace structures at this location, with the Zhanghuatai (章华台) being the most significant of these palatial buildings.[194] Taking advantage of its exceptional natural landscape, these palatial structures were constructed within artificially excavated ponds, enhancing the aesthetic appeal of the area. The water in these ponds was sourced from the Han River, which also facilitated water transportation throughout the entire garden region.[195] Specific details regarding the Ji'nan City site (纪南城遗址) and the Longwan site will be discussed in greater depth in the following sections.

The Bronze Age heritage of the Jianghan Plain remains discernible to this day: the region has historically been one of the significant centres of Chinese civilization. During the Bronze Age, substantial transformations occurred in the landscape of the Jianghan Plain due to societal, economic, and cultural changes. The migration of populations from the Central Plains to the Jianghan Plain introduced new cultural and political systems which led to significant alterations in the landscape features such as agricultural fields, settlement patterns and architectural characteristics. The evolution of these landscape elements is the central focus of this chapter.

In this chapter, the Bronze Age is divided into three distinct phases: the Early Bronze Age, the Middle Bronze Age, and the Late Bronze Age. These phases correspond to the early Shang Dynasty, the late Shang Dynasty, and the Spring and Autumn and Warring States periods of the Eastern Zhou Dynasty respectively. It is important to note that in the Jianghan Plain region, there is a paucity of textual records from the Xia Dynasty and limited archaeological data available for this period. As a consequence information

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[194] 周维权，*《中国古典园林史-第三版》*，（北京：清华大学出版社，2009），页 60. / Weiquan Zhou, *History of Chinese Classical Gardens – Third Edition*, (Beijing: Tsinghua University Press, 2009), p 60.

[195] 周维权，*《中国古典园林史-第三版》*，（北京：清华大学出版社，2009），页 59. / Weiquan Zhou, *History of Chinese Classical Gardens – Third Edition*, (Beijing: Tsinghua University Press, 2009), p 59.

pertaining to the Xia Dynasty will not be addressed in this chapter.

Development of New Settlements

During the mid-to-late Neolithic period, particularly the Qujialing and Shijiahe cultural phases, the Jianghan region functioned as a cohesive entity, its core area the Shijiahe site cluster situated in the central Jianghan Plain at the southern foothills of the Dahong Mountain. During this period, the Jianghan region exhibited cultural homogeneity and relative political autonomy. However, significant changes occurred during the Xia and Shang dynasties. With the southward expansion of Central Plains culture, the Jianghan region transitioned into a local variant of Central Plains culture and became an outlying zone within the Central Plains political system.[196] The internal dynamics of the Jianghan Plain saw a shift where the former core area at the southern foothills of the Dahong Mountain became a peripheral zone, while regions to the north and east of the Han River emerged as focal points. During this period, the Han River clearly demarcated cultural development within the Jianghan region: the eastern side, dominated by Central Plains culture, diverged culturally from the western side, which experienced less influence from Central Plains culture. By the Shang Dynasty, the focal point in eastern Han was located around the Panlongcheng area. The cultural and geographical patterns of the Jianghan region during the Western Zhou period continued to reflect the trends established during the Xia dynasty and Shang dynasty periods.

During the Bronze Age, the Jianghan Plain was one of the significant cultural centres in central China. Due to its abundant water resources and fertile soil, the region emerged as a prominent settlement area during this period. Analysing the settlement patterns on

[196] 豆海峰，*《冲击与调适：长江中游商代文化与社会演进的考古学观察》*，（北京：科学出版社，2021）,页 1-2. / Haifeng Dou, *Impact and Adaptation: An Archaeological Observation of Shang Dynasty Culture and Social Evolution in the Middle Yangtze River Region*, (Beijing: China Science Publishing & Media Ltd., 2021), pp. 1-2.

the Jianghan Plain can provide insights into how ancient communities utilized natural resources and adapted to environmental conditions. This chapter aims to explore how settlements were organized, the surrounding natural geographical environment, and settlement construction patterns during this period. It will examine how ancient people coordinated settlement development with the natural environment and the resultant regional landscape transformations.

Phase-wise evolution of spatial distribution

Early Bronze Age

In the early Bronze Age, settlements in the Jianghan Plain region were primarily distributed along the Yangtze River basin and its tributaries. This pattern of settlement distribution provides insights into the pathways of Central Plain culture dissemination in the Jianghan region during the Xia and Shang dynasties.[197] Specifically, the following analysis will categorize the distribution of settlements in the Jianghan Plain and its surrounding areas during the Xia and Shang periods into two types: one along the main course of the Yangtze River and the other along its various tributaries.

The main flow of the Yangtze River, flowing from west to east through the central region of the Jianghan Plain, serves as a cultural exchange corridor connecting various geographical units including the upper and lower reaches of the Yangtze River and the Dongting Lake Plain. Numerous Bronze Age sites from the mid-period are distributed along the Yangtze River mainstream, such as Jingnan Temple, Panlongcheng (盘龙城

[197] 豆海峰，*《冲击与调适：长江中游商代文化与社会演进的考古学观察》*,（北京：科学出版社，2021）,页 43-44. / Haifeng Dou, *Impact and Adaptation: An Archaeological Observation of Shang Dynasty Culture and Social Evolution in the Middle Yangtze River Region*, (Beijing: China Science Publishing & Media Ltd., 2021), pp. 43-44.

遗址) and Xianglushan Mountain. [198] By utilizing ArcGIS to map the excavated human remains from the Xia and Shang dynasties, these distribution patterns become distinctly observable (Figure 91). As previously mentioned, during the Bronze Age, Central Plain culture had a significant impact on the Jianghan Plain region. To better govern the middle Yangtze region, leaders from the Central Plain introduced their culture into the Jianghan Plain. Consequently, Panlongcheng emerged rapidly during the Shang Dynasty, developing into the largest regional centre in the Jianghan area and exerting a strong cultural influence on its surrounding regions. [199]

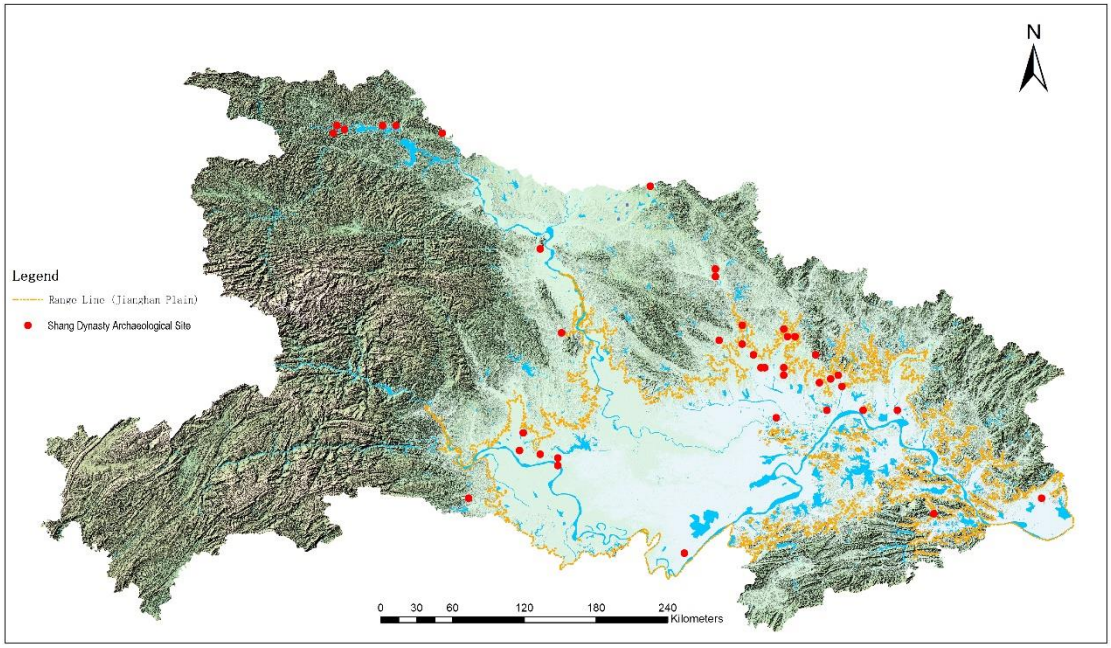


Figure 91. The dispersion pattern of Shang Dynasty's settlements within Hubei Province （Source: created by the author, use ArcMap）

The Jianghan Plain, characterized by its flat and low-lying terrain, serves as a central region where various tributaries of the Yangtze River, originating from the surrounding mountainous areas, converge in a generally north-south direction. Specifically, these

[198] 杨宝成，*《湖北考古发现与研究》*，（武汉：武汉大学出版社，1995），页 73. / Baocheng Yang, *Archaeological Discoveries and Research in Hubei Province*, (Wuhan: Wuhan University Press, 1995), p. 73.

[199] Rowan K. Flad，陈伯桢，*《古代中国内陆》*，（北京：北京联合出版公司，2021），页 168. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021), p. 168.

include the Han River, Fu River, and Qu River systems to the north of the Yangtze, as well as the Li River and Gan River systems to the south (Figure 92). The Jingnan Temple site, situated within the Han River basin, represents a notable cultural relic from the Bronze Age that originated in the Central Plain. It functioned as a significant transit hub for both north-south and east-west routes. Its location at a major intersection of contemporary transportation routes underscores its importance. However, in terms of scale, the Jingnan Temple site is notably smaller than the Panlongcheng site in the eastern part of the Jianghan Plain. Some archaeologists speculate that the Jingnan Temple site was established through a southern migration via the Han River and constructed by settlers from the Central Plain. This site is closely related to the commercial cultural settlements of the Central Plain and the mid-Yangtze region, serving as a cultural transit centre between these two areas. [200]

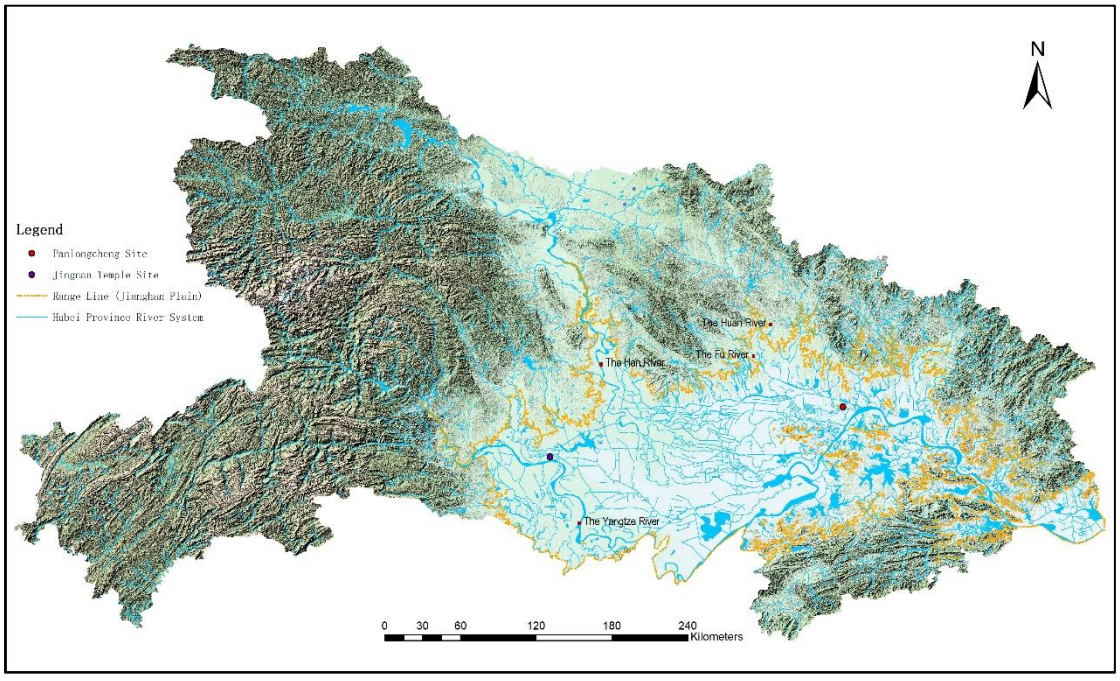


Figure 92. Distribution Map of Rivers in Hubei Province. (Source: created by the author, use ArcMap)

[200] 杨宝成，*《湖北考古发现与研究》*，（武汉：武汉大学出版社，1995），页 89-90. / Baocheng Yang, *Archaeological Discoveries and Research in Hubei Province*, (Wuhan: Wuhan University Press, 1995), pp. 89-90.

Mid-Bronze Age

During the middle to late Shang Dynasty, with the rapid rise of the Panlongcheng settlement in the lower reaches of the Fu River, numerous contemporaneous human settlement sites emerged along the Fu River, the Yuan River, and the Xi River in the vicinity of Panlongcheng. These sites are collectively referred to by archaeologists as the 'Panlongcheng type'.[201] The Panlongcheng site represents the highest level of Shang culture urban settlements in the Jianghan region. It was a large urban centre with palace architecture, established to facilitate the Shang Dynasty's administration of the mid-Yangtze River region.[202] Its strategic location provided highly advantageous water transportation conditions, leading some scholars to hypothesize that Panlongcheng was a significant water transportation hub. [203]

In summary, a comprehensive examination reveals that, prior to the mid-Bronze Age, the Jianghan Plain region exhibited a complex settlement structure with closely interconnected settlements. It is reasonable to hypothesize that the development of this settlement network was closely linked to the transportation via waterways. On one hand, from a socio-economic perspective, the Panlongcheng site, as the regional centre, served as a local capital second only to the central capitals of the Central Plains. Surrounding this site and along significant transportation routes, there were several smaller settlements. Archaeological research suggests that these were strategically distributed to form an interconnected settlement network, which was closely related to the management practices of the Shang Dynasty in the Jianghan Plain region. On the

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[201] 豆海峰，*《冲击与调适：长江中游商代文化与社会演进的考古学观察》*，（北京：科学出版社，2021）,页 58-59. / Haifeng Dou, *Impact and Adaptation: An Archaeological Observation of Shang Dynasty Culture and Social Evolution in the Middle Yangtze River Region*, (Beijing: China Science Publishing & Media Ltd., 2021), pp. 58-59.

[202] 湖北省博物馆，*《盘龙城-长江中游的青铜文明》*，（北京：文物出版社，2007），页 12-13. / Hubei Province Museum, *Panlongcheng – Bronze Civilization in the Middle Reaches of the Yangtze*, (Beijing: Cultural Relies Press, 2007), pp. 12-13.

[203] 邹秋实，<从水系看盘龙城遗址环境的变迁>，*《江汉考古》*，5（2018），页 153-161，第 159-160 页. / Qiushi Zou, 'Environmental variations at the Panlongcheng archaeological site viewed through the lens of the water system', *Jianghan Archaeology*, 5 (2018), 153-161, pp. 159-160.

other hand, the influx of people from the Central Plains into the Jianghan Plain accelerated the process of social complexity during the mid-Bronze Age. In the water-rich Jianghan region, establishing a well-developed water transportation system was undoubtedly one of the optimal choices.

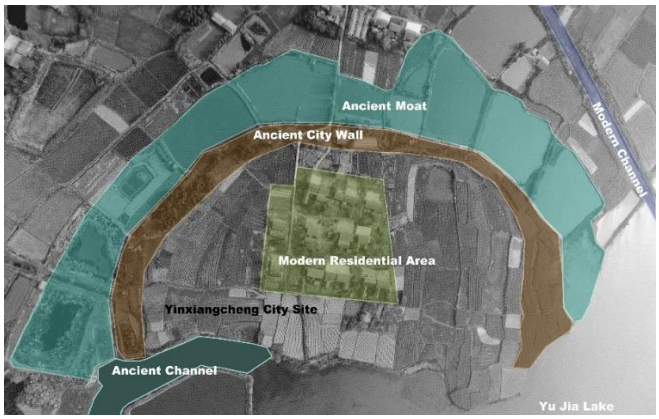


Figure 93. Aerial Photograph of the Yinxiangcheng Site in Jingzhou. (Source: recreated by the author, based on the '孟华平，向其芳，*《湖北史前城址》*,（北京：科学出版社，2015），页：彩版三五. / Huaping Meng, Qifang Xiang, *Prehistoric city ruins in Hubei*, (Beijing: China Science Publishing & Media Ltd), p. colour plate 35.')

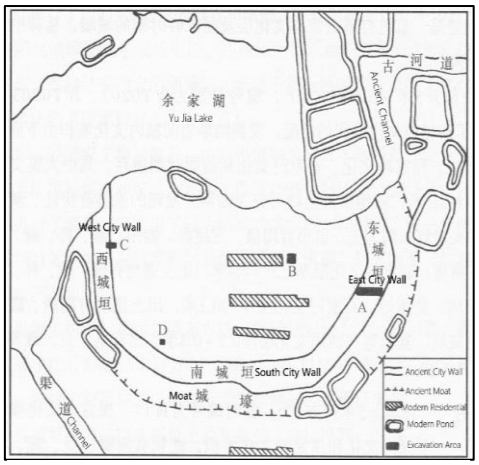


Figure 94. Master Plain of the Yinxiangcheng Site. (Source: recreated by the author, based on the '院文清，*〈湖北荆州市阴湘城遗址东城墙发掘简报〉*,*《考古》*, 05（1997），页 1-10，（第 3 页）. / Wenqing Yuan, 'Concise Overview of the Eastern City Wall Excavation at the Yinxiangcheng Site in Hubei's Jingzhou City', *Archaeology*, 05 (1997), 1-10 (p. 3).)

As time progressed and the Shang Dynasty declined, Panlongcheng was ultimately abandoned during the late Shang period, leading to the near extinction of settlements in the Jianghan Plain region. This resulted in the area becoming a cultural 'blank' zone. During this phase, settlements along the Han River approached extinction, marking the end of the cultural influence that the Central Plains culture had exerted on the Jianghan region through the Han River. The abandonment of Panlongcheng triggered a chain reaction among settlements along the Yangtze River, resulting in the disappearance of sites such as Jingnan Temple and Tonggushan. Nevertheless, a relatively dense distribution of settlements remained visible on the southern side of the Yangtze River, with the settlement of Yinxiangcheng emerging in the western Jianghan region (Figure 93 and 94). This settlement exhibited significant cultural differences from that of the Central Plains, showcasing a distinctive

indigenous cultural style of the Jianghan Plain.[204] The Yinxiangcheng site (阴湘城遗址) was occupied by human settlements from the Daxi Culture of the Neolithic era through the Western Zhou period, gradually becoming abandoned by the Eastern Zhou period.[205] Archaeological reports provide clear floor plans demonstrating that the overall appearance and location of the Yinxiangcheng settlement bear a strong resemblance to those of Neolithic settlements in the Jianghan Plain.

Late Bronze Age

From a macro perspective, the social development of the Jianghan region during the Late Shang period was evidently slow, with its cultural landscape essentially stagnating at a 'steady' phase. However, during the mid to late Bronze Age, specifically in the Spring and Autumn and Warring States periods, the rapid rise of the Chu state significantly increased the number of settlements in the Jianghan Plain (Figure 95). Figure 95 illustrates that during the Spring and Autumn and Warring States periods, which fall under the Eastern Zhou Dynasty, the development of Shang-era settlements in the Jianghan Plain transitioned from the slow growth phase of the Western Zhou period to a more accelerated development phase. This shift can be attributed to several factors: the relatively slow development of the Jianghan Plain during the Western Zhou period, the Chu state's initial material shortages, and the region's early stage of development. Consequently, the overall development level of the Jianghan Plain was not high. By the mid-Spring and Autumn and Warring States periods, advancements in bronze tools and hydraulic engineering, along with the Chu state's 'nurturing' policies, facilitated a rapid development of agriculture in the Jianghan Plain. Scholars suggest that agricultural development in the Jianghan Plain during the Zhou Dynasty was

[204] 贾汉清，<湖北荆州市阴湘城遗址 1995 年发掘简报>,《考古》,01（1998），页 17-28. / Hanqing Jia, 'Excavation Report for the Yinxiangcheng Site in Hubei Jingzhou City in 1995', *Archaeology*, 01 (1998), pp. 17-28.

[205] 院文清，<湖北荆州市阴湘城遗址东城墙发掘简报>，《考古》，05（1997），页 1-10，（第 3 页）. / Wenqing Yuan, 'Concise Overview of the Eastern City Wall Excavation at the Yinxiangcheng Site in Hubei's Jingzhou City'. *Archaeology*, 05 (1997), 1-10 (p. 3).

unevenly distributed, primarily concentrated in the middle reaches of the Han River and the western regions of the Jianghan Plain.[206] This uneven distribution likely resulted in a banded pattern of settlement distribution in the Jianghan Plain during the Spring and Autumn and Warring States periods. By the late Warring States period, following the Qin state's occupation of the Jianghan region, the large-scale migration of the Chu people eastward and southward led to a sharp decline in the population and a reduction in the overall level of social development, which persisted into the early Western Han period.

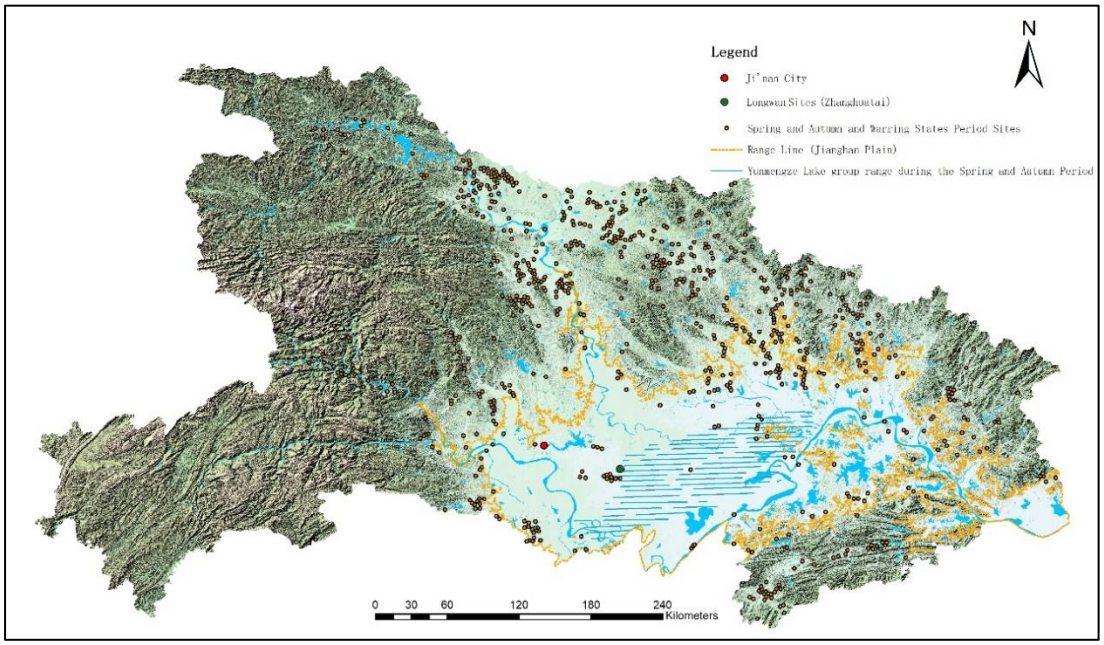


Figure 95. The settlements dispersion of Spring and Warring State Period within Hubei Province （Source: created by the author, use ArcMap）

Throughout the Spring and Autumn and Warring States periods, the distribution of settlements in the Jianghan Plain underwent significant changes, profoundly influenced by the dominance of the state of Chu in the region. As one of the most influential feudal

[206] 刘俊男，*《长江中游地区文明进程研究》*，（北京：科学出版社，2014）/ Junnan Liu, *Research on the Civilization Process in the Middle Reaches of the Yangtze River*, (Beijing: Science and technology of China press, 2014).

states of the time, Chu's cultural, political, and military activities substantially shaped the developmental trajectory of settlements in the Jianghan Plain.[207]

Firstly, from a geographical distribution perspective, the settlements in the Jianghan Plain during the Spring and Autumn and Warring States periods were notably denser and larger. This pattern reflects the agricultural development and population growth fostered by the State of Chu in the region. To sustain its economic base and military needs, Chu undertook extensive land reclamation, which facilitated the intensification of agricultural production and the expansion of settlement sizes. Chu capitalized on its control over the Jianghan river system by developing water conservancy projects and enhancing navigation, thereby further promoting settlement distribution along the waterways and reinforcing its strategic control and utilization of the area. This approach mirrors the methods employed by central plains states during the mid-Bronze Age to manage the region.

Secondly, the political and cultural impact of the Chu state on settlements was highly significant. By establishing a system of prefectures and counties, the Chu state set up administrative centres and military fortresses in the Jianghan Plain. These political and military settlements became crucial means for the Chu state to control and manage the region. [208] Not only did these settlements serve as nodes for administrative management and military deployment, but they also became centres for the dissemination of Chu culture. The language, religious beliefs, customs and artistic styles of the Chu state were widely spread and practised within these settlements, thereby deepening the influence of Chu culture in the Jianghan Plain. Among these

[207] Rowan K. Flad, 陈伯桢, *《古代中国内陆》*, (北京：北京联合出版公司，2021), 页 180-182. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021), pp. 180-182.

[208] 湖北省文物考古研究所，*《纪南城-考古发现》*，(武汉：江汉考古编辑部)，页 95. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nan City: Archaeological Discoveries,* (Wuhan: Jianghan Archaeology Editorial Department, p. 95.

developments, the establishment of the Chu capital represented not only the highest political region of the Chu state but also a new cultural element in the Jianghan Plain during the Bronze Age. During the Warring States period, the Chu state relocated its capital several times, with the Ji'nan city ruins being one of the most significant capitals located in the Jianghan Plain. Ji'nan city, situated in the central part of the Jianghan Plain, is surrounded by hills to the north and is bordered by the Han River, Yangtze River, and Changhu Lake. These major rivers and their tributaries formed an intricate river network within the city. In addition to the capital, the emergence of the Longwan site, the first royal garden in the Jianghan Plain, was also a notable man-made landscape of the Bronze Age. Detailed analysis of the Ji'nan city ruins and the Longwan site will be provided in the following sections.

The State of Chu enhanced its influence over surrounding regions through its network of settlements. The settlements in the Jianghan Plain served not only as centres for economic and political activities but also as strategic outposts for interaction and conflict with other feudal states.[209] Through these settlements, Chu effectively managed and utilized the resources of the Jianghan Plain, strengthening connections with other areas and expanding its influence during the Spring and Autumn and Warring States periods. As previously discussed, Chu shaped the development trajectory of settlements in the Jianghan Plain through agricultural advancement, administrative management, and cultural dissemination, transforming them into significant carriers of Chu culture and political influence.

In summary, prior to the mid-Bronze Age, during the Xia and Shang periods, as Central Plain culture expanded southward, the Jianghan Plain emerged as a local variant of Central Plain culture in terms of its cultural characteristics and became a peripheral

[209] Rowan K. Flad, 陈伯桢, *《古代中国内陆》*, (北京：北京联合出版公司，2021), 页 182. / Rowan K. Flad, Bozhen Chen, *Ancient Central China*, (Beijing: Beijing United Publishing Co., Ltd., 2021), p. 182.

region within the Central Plain political system. Within the Jianghan Plain, the original core area on the southern slopes of the Dahongshan range transitioned to a marginal zone, while the focus shifted to the regions north and east of the Han River, which became the new centres of significance, with the Han River serving as a distinct boundary. During this period, settlements on the Jianghan Plain were primarily distributed along the Yangtze River basin and its tributaries, and their numbers were fewer compared to the Neolithic Shijiahe culture period. By the Western Zhou period, the focus of the Jianghan region remained in the areas north and east of the Han River, with the Han Riverbanks continuing to reflect a political dichotomy. The Jianghan Plain had lost much of its former prosperity at this time, showing a clear regression in both the number and scale of settlements compared to the late Neolithic period. In the Eastern Zhou period, the rise of the Chu state disrupted the longstanding fragmentation of the Jianghan region that had persisted since the Xia, Shang and Western Zhou periods, thus ending the political division along the Han Riverbanks. Under Chu rule, the Jianghan Plain experienced the introduction of new cultural elements through the establishment of the capital and royal gardens. However, the uneven distribution of agricultural development in Chu led to a band-like distribution pattern of settlements in the Jianghan Plain during the Spring and Autumn and Warring States periods.

Microtopography site selection

The previous section analysed the distribution characteristics of settlements in the Jianghan Plain during the Bronze Age from a macro perspective. This subsection will examine the site selection and geomorphological characteristics of settlement remains from a micro perspective.

Initially, specific geographic coordinates of some Bronze Age settlement sites have been documented in relevant archaeological studies. Building on this, high-resolution

satellite imagery has been employed to observe ancient ruins from an aerial perspective. Additionally, elevation data has been used to determine the micro topographical features of each settlement site. This approach provides a novel perspective for studying the characteristics and evolution of settlement landscapes during the Bronze Age.

By employing satellite remote sensing technology and analysing the remote sensing imagery, this study identifies two primary types of settlement topographies from the Xia and Shang dynasties in the region. The first type consists of sites situated on small hills, where the ground elevation is 2 to 10 metres higher than the surrounding terrain, creating a distinct topographical contrast (Figure 96, 97, and 98). The second type comprises sites located in the plains, where the elevation of the sites is nearly level with the surrounding terrain, exhibiting minimal topographical variation (Figure 99). These findings provide significant insights into the settlement location choices and construction methods of ancient peoples in the Jianghan Plain during the Bronze Age.



Figure 96. The initial type settlement – 'Panlongcheng Site', (Source: recreated by the author, based on the Google Earth)



Figure 97. The initial type settlement – 'Shaishutai Site', (Source: created by the author, based on the Google Earth)



Figure 98. The initial type settlement – ‘Ji’nan City Site’, (Source: recreated by the author, based on Google Earth)



Figure 99. The second type settlement – ‘Xianglushan Site’, (Source: recreated by the author, based on Google Earth)

The differences between these two geomorphological forms reflect how ancient communities adopted varied construction strategies and lifestyles based on local environments and available resources. This paper hypothesizes that settlements located on elevated terrains were likely established to enhance their natural defensive advantages and their ability to monitor the surrounding environment, whereas settlements on plains were probably more conducive to agricultural practices and transportation. As discussed, the Jianghan Plain predominantly features river-lake alluvial plains, with additional low ridges and residual hills. This topographical variety contributed to several common characteristics of Bronze Age settlement landscapes in this region. Settlements were typically distributed along natural water systems and were strategically placed on either ‘ridge’ or ‘plain’ terrains. These choices in settlement locations reflect the adaptability and utilization of the living environment by the inhabitants of the Jianghan Plain during the Bronze Age, further evidencing the profound environmental awareness and diverse lifestyles of ancient societies.

Two construction typologies

The previous discussion indicated that the micro-environmental landscape characteristics surrounding settlement sites in the Jianghan Plain during the Bronze Age can be classified into two types. So how did the early inhabitants utilize these geomorphological features in the construction of their settlements?

Based on a comparative analysis of relevant archaeological reports, numerous aerial images, and satellite remote sensing data, this chapter will address the construction methods of settlements. It identifies two main types of construction method for settlements located on elevated landforms. The first type involves the modification of natural landforms to create settlements which exhibit a near-oval or rectangular platform shape, often including the construction of walls and moats on top of these platforms. The second type utilizes the natural landforms directly for settlement construction. In contrast, settlements situated on flat plains are generally constructed at ground level, with minimal evidence of large-scale features such as walls, moats, or tamped earth platforms. Consequently, this chapter classifies the construction methods of Bronze Age settlements in the Jianghan Plain into three categories.

1. The first category of settlements is exemplified by the Panlongcheng and Ji'nan City sites, which represent ancient cities from the Bronze Age constructed during different historical periods and by different regimes. These sites typically feature prominent artificial defensive structures such as city walls and moats. Notably, archaeological surveys and the anatomical analysis of city walls indicate that the nearly square city wall of Panlongcheng was constructed

utilizing two naturally occurring parallel ridges oriented north-south (Figure 100, and Figure 101). In contrast, the Ji'nan City site, located in the western part of the Jianghan Plain, reveals in satellite imagery a suspected 'city wall' built around the edge of a platform, which appears to form a complete defensive system together with the surrounding 'moat' (Figure 102). In addition to these defensive structures, archaeologists have identified remnants of large palace buildings at both sites (Figure 103), marking a significant development in the landscape of the Jianghan Plain during the Bronze Age. [210] The palatial architecture will be discussed further below. Consequently, it is reasonable to infer that such Bronze Age settlements were likely large, high-status communities.

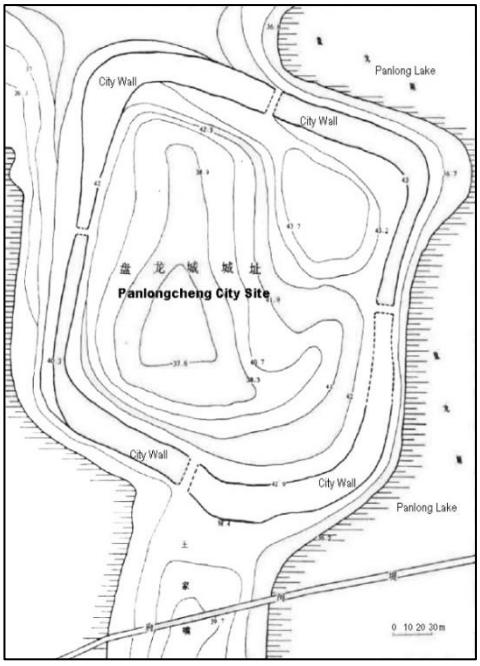


Figure 100. The master plan of the Panlongcheng Site (Source：湖北省文物考古研究所，《盘龙城-1963-1994 年考古发掘报告（上册）》，(北京：文物出版社，2001)，页 15. / The Hubei Provincial Institute of Cultural Relics and Archaeology, The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I), (Beijing: Cultural Relies Press, 2001), pp. 15.)



Figure 101. City wall remains in the Panlongcheng Site. (Source: captured by the author)

[210] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，(北京：文物出版社，2001)，页 14-16. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 14-16.



Figure 102. Satellite image of Ji'nan City Site (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），彩版 4. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nan City: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, colour

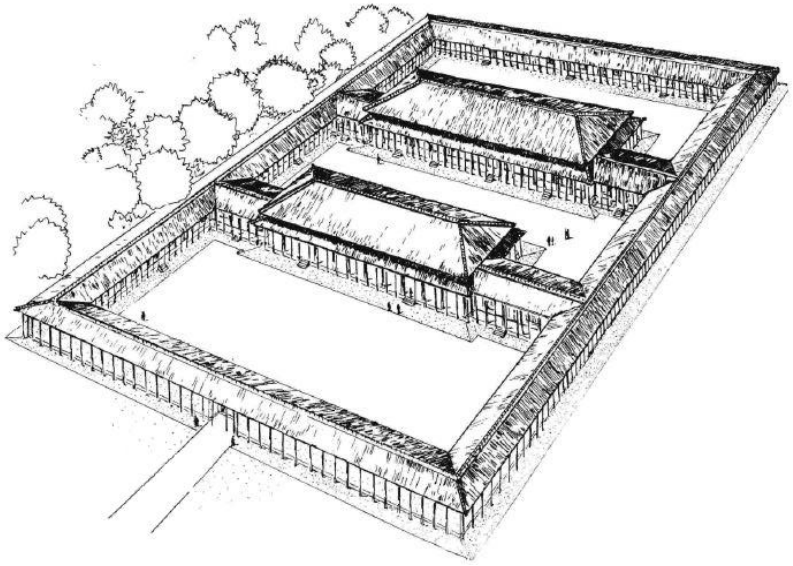


Figure 103. Reconstruction of the palace at Panlongcheng Site (Source: 湖北省博物馆，*《盘龙城-长江中游的青铜文明》*，（北京：文物出版社，2007），页 13. / Hubei Province Museum, *Panlongcheng – Bronze Civilization in the Middle Reaches of the Yangtze*, (Beijing: Cultural Relies Press, 2007), p. 13.)

2. The construction method for the second type of settlement involves the direct use of natural elevation without significant artificial modification. Settlements such as Xianglu Mountain and Jingnan Temple follow this construction approach (Figure 104). It is noteworthy that an analysis of the area of these

settlement sites reveals that the extant area of such platforms typically ranges from 10,000 to 50,000 square metres.



Figure 104. Satellite image of Jingnansi Settlement Site (Source: recreated by the author, based on Google Earth)

3. The construction method for settlements of the third category is the simplest, involving the establishment of structures on flat terrain. For instance, the archaeological sites such as Shashi Lijiatai and Zhouliangyuqiao along the Yangtze River exhibit extremely flat surface features in aerial and satellite imagery. This observation suggests that the construction method for these settlements involved building on flat ground.

Urban water systems

To discuss the distribution of water systems within ancient cities, it is essential to first analyse the morphology of these cities. In his article, Kwang-chih Chang noted that during the entire Bronze Age, China's primary social units were encircled by earthen walls.[211] These cities typically appeared as quadrilateral or rectangular structures, with

[211] 张光直，*《中国青铜时代》*，（上海：三联书店，2013），页 109. / Kwang-chih Chang, *The Bronze Age in China.*

each wall segment usually featuring at least one city gate and corners often forming right angles.[212] Although Chang's observations primarily pertain to the North China Plain, it is important to note that at the time of his writing, the archaeological evidence for Bronze Age cities in the Yangtze River basin was not yet fully developed. Based on current archaeological data, this paper contends that cities were also the fundamental social units in the Jianghan Plain during the Bronze Age, exhibiting similar morphological characteristics, albeit with a sparser distribution compared to the North China Plain.

In ancient literature, there is scant information regarding the urban forms of the Bronze Age cities in the Jianghan Plain. Consequently, investigating this issue primarily relies on contemporary archaeological excavations. To date, while the number of Bronze Age urban sites excavated in the Jianghan Plain is not extensive, it is not entirely negligible either. Among these sites, the Jinan city ruins, serving as the capital of the Chu state, stand out as a representative example from that period. This paper will use the Ji'nan city ruins as a case study to conduct a detailed analysis of the water system distribution in this late Bronze Age city, thereby exploring the distinctive landscape characteristics of that era.

The site of Ji'nan City is the largest known ancient city from the Bronze Age in southern China. [213] The surrounding land is fertile, and both water and land transportation are highly accessible. To the east lies the Jianghan Plain, while the western side is bordered by rugged mountains. The southern boundary is defined by the Yangtze River, and the

(Shanghai: SDX Joint Publishing Company, 2013), p. 109.

[212] 张光直，*《中国青铜时代》*，（上海：三联书店，2013），页 109-110. / Kwang-chih Chang*, The Bronze Age in China.* (Shanghai: SDX Joint Publishing Company, 2013), pp. 109-110.

[213] 湖北省博物馆，<楚都纪南城的勘查与发掘（上）>，*《考古学报》*，03（1982），页 325-350，（第 325 页）. / Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica*, 03 (1982), 325-350 (p. 325).

northern edge connects to ancient routes leading to the Central Plains (Figure 105). Currently, some archaeologists have identified the precise courses of ancient rivers from the Bronze Age through soil core drilling. Within Ji'nan City, four ancient river channels have been discovered (Figure 106). These channels are interconnected, and while the easternmost channel has been silted and transformed into farmland, the majority of the remaining three channels are covered by contemporary rivers. From an aerial perspective, the outlines of the ancient river channels in Ji'nan City are still discernible despite more than two millennia having passed (Figure 107).

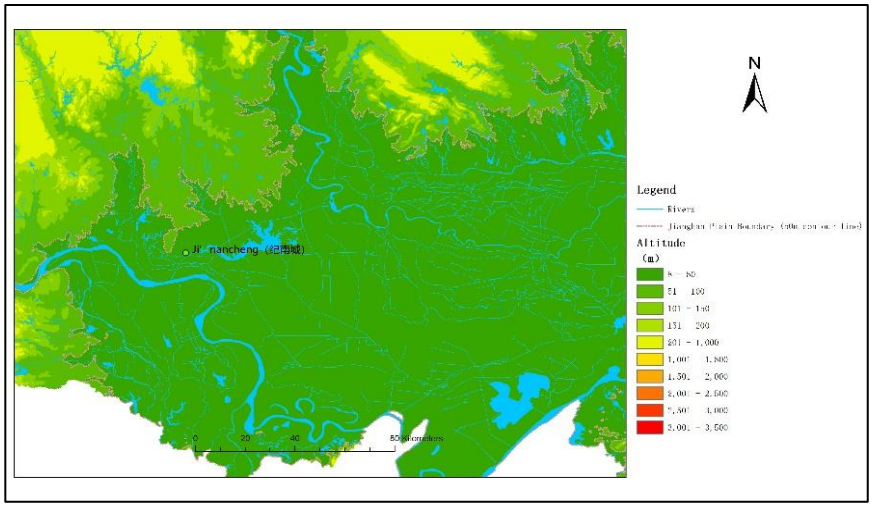


Figure 105. Map of the location of the Ji'nan City Site, (Source: created by the author, use ArcMap)

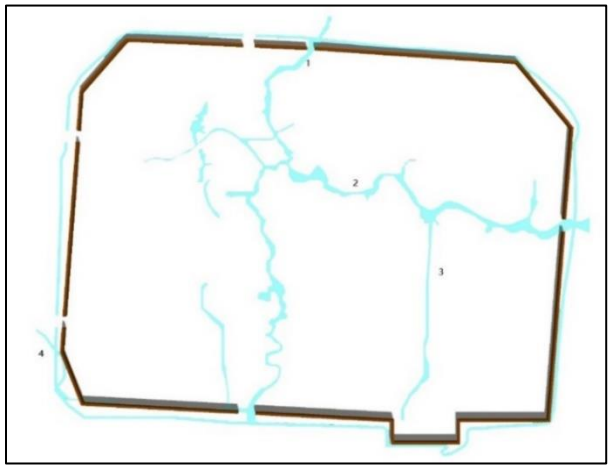


Figure 106. Map of the ancient water system in the Ji'namcheng Site, (Source: created by the author, based on the 'Distribution map of the ruins of Ji'nan City', 湖北省博物馆，<楚都纪南城的勘查与发掘（上）>，*《考古学报》*, 03（1982），页 325-350，（第 331 页）. / Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica,* 03 (1982), 325-350 (p. 331).)



Figure 107. Aerial photograph of Ji'nan City Site. (Source: captured by the author)

During the Bronze Age, when people lacked scientific understanding of river flow and fluctuations, the majority of ancient cities employed defensive measures such as walls and moats to keep floodwaters at bay and protect their inhabitants. However, the builders of Ji'nan City adopted a more audacious approach. In addition to constructing conventional city walls and moats, they also diverted two natural rivers, flowing from the north and south, into the city's interior. These artificially carved ancient river channels exhibit numerous bends and meanders that mimic natural river patterns, indicating deliberate design by the builders.

During the field investigation, it was observed that, currently, extensive agricultural fields and fishponds, along with the population that relies on them, flank the riverbanks (Figure 108). This region is abundant in water resources; however, flooding also constitutes a significant historical challenge for the Jianghan Plain. For a capital situated in a low-lying plain, the most substantial threat may not come from external adversaries but from the recurring seasonal floods, which pose the most severe danger. The rainy season in the south constantly reminds artisans of the Chu state to mitigate flood-related disasters. This chapter posits that, as a result, the designers of Jinan City employed artificial interventions to allow natural river water to flow through the city. This

approach not only reduces the city's vulnerability to flooding and alleviates the traditional flood defence systems, such as moats and city walls, but also provides a water source for the urban population. Additionally, the skilled artisans, well-versed in hydrology, deliberately designed artificial channels and river bends to slow down the floodwaters, thereby preventing internal flooding within the city.



Figure 108. Aerial photograph of Ji'nan City (Source: captured by the author)

Given the awareness of potential flooding, why would one choose to channel the rapidly rising river waters into a city? Is this unique design intended to address the issue of water supply for the densely populated urban area, or to manage the discharge of substantial amounts of domestic wastewater? This chapter argues that the likelihood of wastewater management as a primary objective is minimal, as such an approach would not only fail to remove wastewater from the city but would also lead to river pollution. Archaeologists have identified a sewage system in the ancient city of Jinan, consisting of multiple ceramic drainage pipes (Figure 109), and have also uncovered thousands of well remnants within the city (Figure 110). [214] Typically, residents of ancient cities lived near wells and relied on well water for their daily needs. Based on the design, size, and spatial distribution of these facilities, this paper hypothesizes that Jinan's sewage

[214]陈祖全，<一九七九年纪南城古井发掘简报>，《文物》，10（1980），页 42-49，（第 42 页）. / Zuquan Chen, 'Report on the Excavation of the Ancient Well in Ji,nancheng in 1979'. *Cultural Relics*, 10 (1980), 42-45 (p. 42).

and water purification systems were deliberately separated and specifically designed for distinct functions.

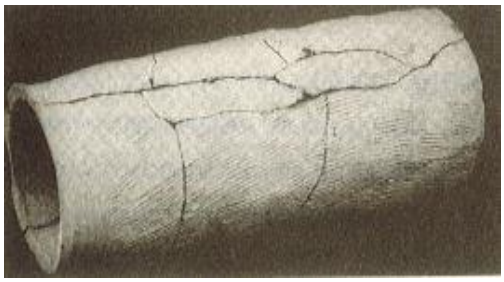


Figure 109. Drainage pipes in the Ji'nan City Site, (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），页 161. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji ' nan City: Archaeological Discoveries,* (Wuhan: Jianghan Archaeology Editorial Department), p. 161.)

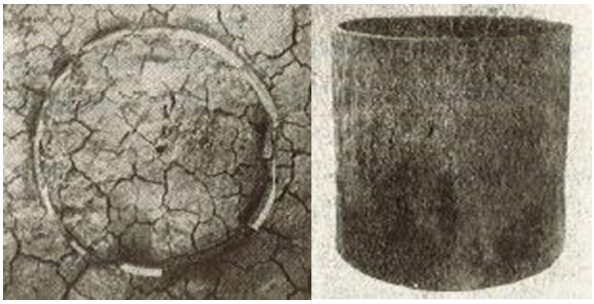


Figure 110. Drainage wells in the Ji'nancheng Site, (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），页 16 和 60. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nan City: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, p. 16 and 60.)



Figure 111. Tripod cooking vessel in the Ji'nancheng Site, (Source: 湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），页 76. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nancheng: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, p. 76.)

Furthermore, archaeologists have excavated a bronze cauldron (Figure 111) from the Jinan Cheng site. This artifact is a typical small-mouthed cauldron with three elevated feet at the base, a distinctive style of the Warring States period in the Jianghan Plain. The design of the cauldron, with its raised feet, was intended to facilitate prolonged heating at the bottom. Archaeological evidence indicates that this small-mouthed cauldron was used primarily for heating water and soup, differing from the traditional large-mouthed cauldrons used for cooking meat. [215] Therefore, it has been inferred that the inhabitants of Jinan Cheng had already

[215]韩楚文，<纪南城松柏鱼池探掘简报>，*《江汉考古》*，03（1987），页 22-29，（第 27-29 页）. / Chuwen Han, 'Exploratory Report on the Excavation of the Songbai Fishond in the Ji'nancheng Site'. *Jianghan Archaeology*, 03 (1987), 22-29 (pp. 27-29).

developed the practice of drinking boiled water during the Bronze Age, suggesting that knowledge of bacterial elimination through boiling was widespread at that time.

The meticulous planning of the Ji'nan City site, including the arrangement of water extraction, usage, and drainage systems, reflects the city's emphasis on public health management. For such a large city as Jinan Cheng, which was the largest in the Jianghan Plain during the Bronze Age, effective public health management was crucial for sustaining population growth. In addition to the abundant food supply provided by rice cultivation, the management of water resources was a key factor. The city's water system, comprising rivers, moats, water supply and drainage channels, and wells, was an essential element for its proper functioning.

During the field survey of the Ji'nan City ruins, it was observed that nearly every rammed-earth platform within the city is surrounded by one or two ponds. Based on the principle that the soil required for constructing the city walls was obtained from excavating the surrounding moat, it has been inferred that these ponds likely formed as a result of the excavation pits used to source the soil for the construction of the platforms. This construction approach employed by the artisans of the Chu State can be regarded as a dual-purpose strategy: on one hand, it provided sufficient soil for the construction of palace foundations, and on the other hand, it altered the natural landscape around the palace, thereby creating a garden-like architectural style and, to some extent, providing a water source for the palace's occupants.

Outside the city walls of Ji'nan, there is a surrounding low-lying area that was identified by archaeologists as the remnants of the historical moat (Figure 112). According to archaeological surveys of the Jinan city site, the moat is located approximately 20-40

metres from the outer slope of the city walls. [216] The moat encircles the city walls and aligns closely with their shape, reflecting characteristics similar to those found at ancient city sites in the Jianghan Plain from the Neolithic period.

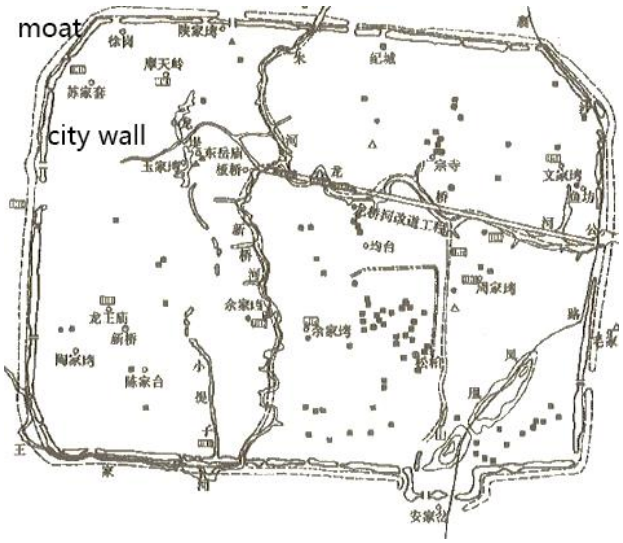


Figure 112. Distribution map of the ruins of Ji'nancheng, (Source: 湖北省博物馆，〈楚都纪南城的勘查与发掘（上）〉，*《考古学报》*，03（1982），页 325-350，（第 331 页）．/ Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica*, 03 (1982), 325-350 (p. 331).)

Ji'nan City featured eight city gates, including a land gate and a water gate on the northern side, as well as a water gate on both the southern and eastern sides. [217] This discovery partially substantiates that, during that period, the early inhabitants of the Jianghan Plain had implemented advanced urban planning concepts such as the separation of pedestrian and vehicular traffic, as well as the differentiation of water and land routes. By conducting a comprehensive examination of the ancient river channels,

[216]湖北省博物馆，<楚都纪南城的勘查与发掘（上）>，*《考古学报》*，03（1982），页 325-350，（第 329 页）．/ Hubei Province Museum, 'Survey and excavation of the capital City of Chu State (Part 1)'. *Acta Archaeology Sinica*, 03 (1982), 325-350 (p. 329).

[217]湖北省文物考古研究所，*《纪南城-考古发现》*，（武汉：江汉考古编辑部），页 29-30. / Hubei Provincial Institute of Cultural Relics and Archaeology, *Ji'nancheng: Archaeological Discoveries*, (Wuhan: Jianghan Archaeology Editorial Department, pp. 29-30.

the broad water gates, and the surrounding water systems of Jinan City, this study reveals that these three water gates could directly connect to Changhu Lake via the rivers, which in turn, provided access to the Yangtze River (Figure 113).

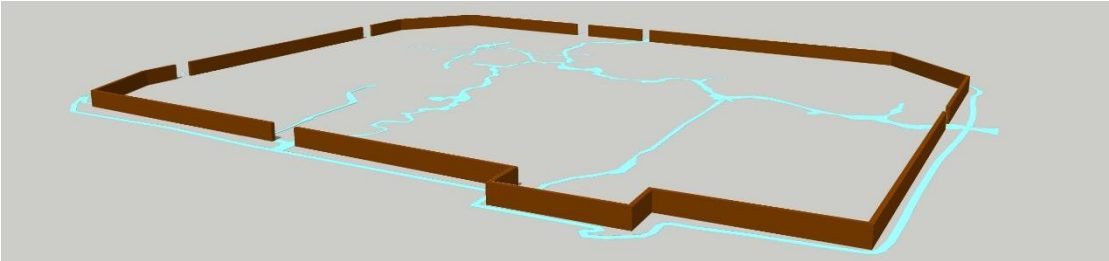


Figure 113. Demonstration of a 3D model of the Ji'nan City Site., (Source: created by the author)

The moat and ancient waterways of the Ji'nan City site constitute a comprehensive water management system. This system facilitated the inflow and outflow of water within the city and enhanced defence and transportation. Additionally, the ancient use of wells, with thousands integrated into this water system, maximised daily water needs for nearly all residents. These features reflect the advanced level of urban infrastructure technology in Ji'nan City. Such a water management system not only connected different spatial areas within the city but also linked Ji'nan City to other urban centres in the Yangtze River Basin, such as the ancient city of Liangzhu in the lower Yangtze region. This chapter posits a bold hypothesis: the design may have been an intentional, extensive water transportation network. In contemporary society, major cities are typically located near water sources, such as Wuhan, situated at the confluence of the Han and Yangtze Rivers; Chongqing, at the confluence of the Jialing and Yangtze Rivers; and Nanjing, through which the Yangtze River flows directly. This chapter suggests that the site selection and construction model of Ji'nan City offers valuable insights and lessons for modern urban development.

Early Palace – Panlonghcheng Site Palace

Architectural layout of the palace

During the Shang Dynasty, as Central Plains culture continued its southward expansion, the Shijiahe culture of the Jianghan Plain was gradually supplanted, with its cultural distribution becoming incorporated into the territory of the Shang Dynasty. Against this backdrop, the culture of the Yangtze River Basin began to blend with the Central Plains culture in China, leading to the construction of Panlongcheng Site. As a Shang Dynasty urban site featuring large palace structures, Panlongcheng has been extensively excavated over the past fifty years. These excavations have revealed a variety of landscape elements, including city walls, moats, noble tombs, workshops and the foundations of three large palaces.[218] Overall, Panlongcheng represents a cultural landscape characterized by the predominance of southward Central Plains culture, interwoven with the local Shijiahe culture, thereby embodying the regional characteristics of the Shang Dynasty. Consequently, the palace architecture and the urban layout of Panlongcheng exhibit considerable similarities to those of the Central Plains.

The *Artificer's Record (《考工记》)* describes the Zhou royal palace in the Central Plains as follows: 'There are nine inner chambers, where nine consorts reside; there are nine outer chambers, where nine ministers attend.'[219] This description depicts the earliest known palace construction model in China— 'front court and rear residence'— which was subsequently adopted in most palace buildings throughout Chinese history.

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[218] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 42-44. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 42-44.

[219] *《考工记》. / Artificer's Record.*

Historical records suggest that this architectural layout can be traced back to the Shang Dynasty and was used up until the Ming Dynasty's Forbidden City in Beijing, which still adhered to this construction model. However, compared to the Shang Dynasty's Panlongcheng, the Forbidden City is undoubtedly a more complex and expansive architectural ensemble, with both the 'court' and 'residence' consisting of numerous interconnected buildings.

In Figure 114, the ruins of three palace structures (designated as F1, F2, and F3) within the Panlongcheng archaeological site are situated in the northeastern part of the city. These structures are arranged in a longitudinal parallel alignment from south to north along a north-south axis. Specifically, the F1 palace occupies a central position, with the F2 palace to the south and the F3 palace to the north of F1. According to archaeological reports, the F1 palace consists of four adjacent rooms, and the layout of its foundation exhibits characteristics typical of residential spaces[220] The earthen platform includes remnants of wooden frame walls, which delineate four east-west oriented rooms. Additionally, 43 postholes are evenly distributed along the edges of the platform, surrounding these four rooms. Based on the findings of the excavations, it is clear that the foundation of this large palace structure (F1) has a rectangular layout, built upon an earthen platform with surrounding corridors and featuring four aligned rooms at its centre.

The foundation of the F2 palace is characterized by a large hall that is smaller in area than the F1 palace, although it has a greater interior depth. The earthen platform of F2 is constructed using red clay and exhibits a rectangular shape. In contrast to the F1 palace, no remnants of wooden frame walls have been found here; however, there are

[220] 杜金鹏，<盘龙城商代宫殿基址讨论>，*《考古学报》*，02（2005），页 161-182. / Jinpeng Du, 'Discussion on the Shang Dynasty Palace Site at Panlongcheng Site', *Acta Archaeologica Sinica*, 02 (2005), pp. 161-182.

large postholes present. An analysis from the perspective of architectural layout indicates that the four symmetrically positioned gaps around the edges of the platform may serve as access points to F2. Based on this analysis, it is suggested that this palace functioned as an audience hall.

As for the F3 palace, extensive excavation has yet to be conducted by the archaeological community, so it is currently known only to have a rectangular layout-oriented east-west, also built upon a platform approximately 5 metres wide, with further details remaining unclear.

Based on the above considerations, it is reasonable to hypothesize that the palace architecture at the Panlongcheng Site represents a high platform construction with a ‘front court and rear residence’ layout. This hypothesis is supported by the following observations: first, the three palace remnants (F1, F2, F3) are all constructed on rammed earth foundations; second, the two excavated palace foundations (F1, F2) are aligned parallel to each other and exhibit a rigorous and orderly architectural structure; third, the three palaces (F1, F2, F3) are situated along the same north-south axis; fourth, among the two excavated palace foundations, the F2 palace shows no evidence of internal partitioning, whereas the F1 palace contains four contiguous rooms, suggesting that the former functioned as the ‘front court’ and the latter as the ‘rear residence’, thereby forming a ‘front court and rear residence’ arrangement.

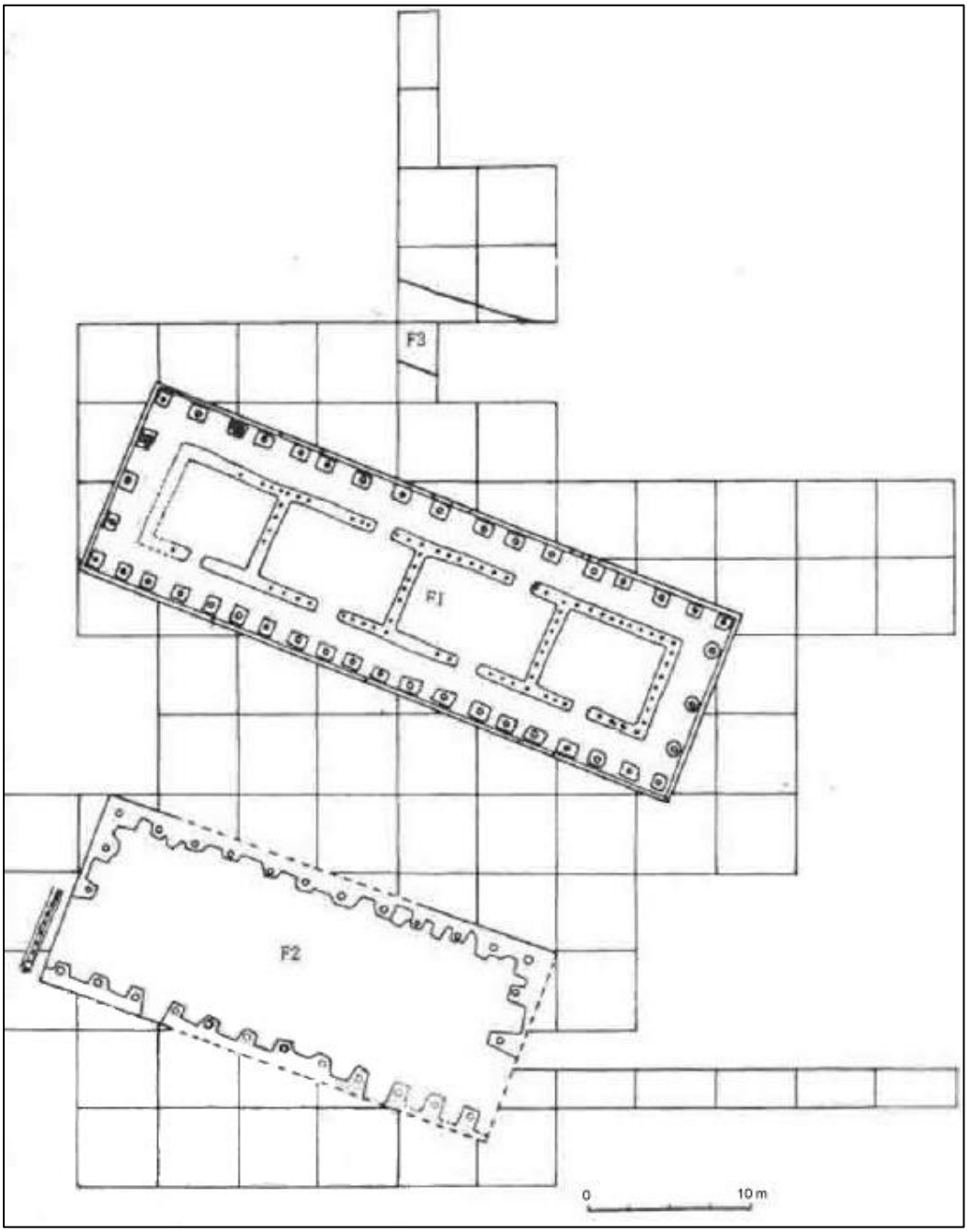


Figure 114. Location Map of the F1, F2, and F3 Palace Foundations within Panlongcheng Site. (Source: 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 43. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 43.)

Corridors

From Figure 114, it is evident that the structure of Palace F3, located to the north of Palace F1, has a narrower footprint compared to Palaces F1, and F2. Its dimensions are insufficient for it to be considered an independent building, and its proximity to Palace F1 suggests that F3 was not a standalone architectural feature. According to archaeological reports, the distance between Palace F1, and F3 is approximately 7.5 metres. [221] From a landscape planning perspective, Palace F3 is likely part of the corridor associated with Palace F1, with the intervening space serving as an area suitable for a courtyard, thereby creating a distinctive architectural landscape combination. The Panlongcheng site represents a fusion of Central Plains culture and the indigenous culture of the Jianghan Plain. A palace constructed under the rule of the Central Plains people would naturally exhibit architectural features related to contemporary palaces in the Central Plains region.

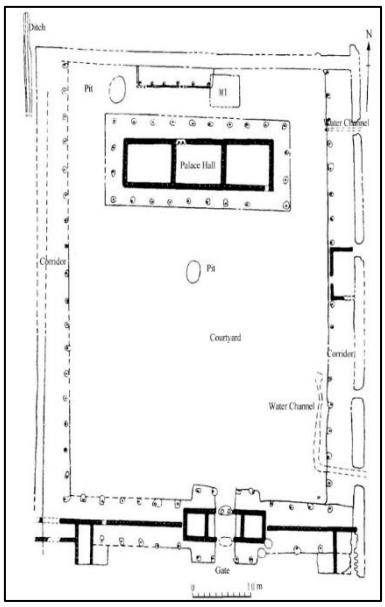


Figure 115. Plan of Erlitou Site No.2 palace ruins (Source: 赵芝荃，郑光，〈河南偃师二里头二号宫殿遗址〉，*《考古》*, 03（1983），页 206-216. / Qanzhi Zhao, Guang Zheng, 'The Erlihous Site of the second palace in Yanshi, Henan., *Archaeology*, 03 (1983), pp. 206-216.)

Currently the representative palace structures of the Shang Dynasty in the Central Plains region include the Erlitou Site and the Yanshi Shangcheng Site. The Erlitou Palace Site No. 2 is characterized by a rectangular layout which is divided into three components: the main hall, the courtyard, and the surrounding corridors (Figure 115). The eastern, western and southern sides of the courtyard are enclosed by corridors. The southern corridor is

[221] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 42. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 42.

interrupted by a gateway, which is aligned with the north-south axis formed by the courtyard and the main hall. Analysis of the published floor plans suggests that these corridors enclose the main hall and the courtyard, and their similar widths imply that they may have had similar functions from a landscape perspective. Based on their width, it can be inferred that they were not simply rammed earth walls but rather specialized corridor structures with specific functions.

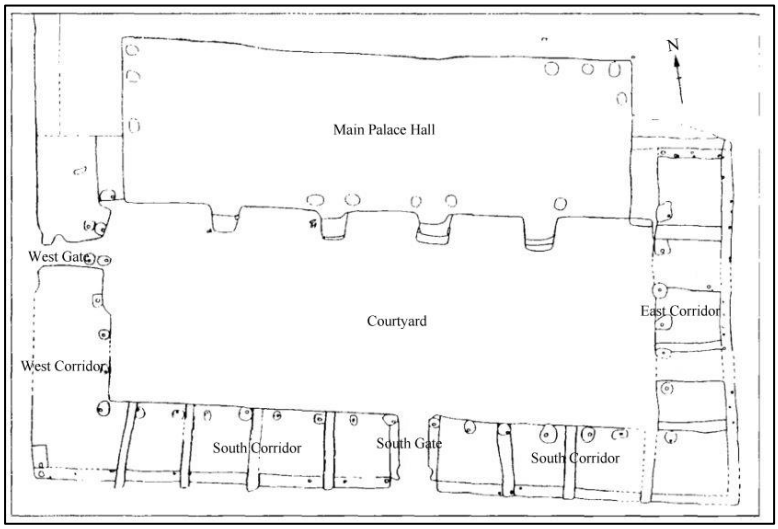


Figure 116. Site plan of the No. 4 palace foundation at Yanshi Shang Site. (Source: 杜金鹏，<盘龙城商代宫殿基址讨论>，*《考古学报》*，02（2005），页 161-182. / Jinpeng Du, 'Discussion on the Shang Dynasty Palace Site at Panlongcheng Site', *Acta Archaeologica Sinica*, 02 (2005), pp. 161-182.)

The architectural layout of the base of the Fourth Palace at the Yanshi Shangcheng site bears similarities to that of the Second Palace at the Erlitou site, although there are notable differences (Figure 116). The Fourth Palace area at Yanshi Shangcheng is also rectangular in shape, with its spatial organization generally divided into three components: the main hall, the courtyard and the surrounding corridors. Also, the main entrance of the southern corridor aligns with the north-south axis formed by the courtyard and the hall. However, unlike the Second Palace at Erlitou, the palace structures and courtyards here are of comparable size. The main palace building connects with the eastern and western corridors, with a western city gate located in the western corridor. This courtyard design model, characterized by the integration of corridors and buildings, is also reminiscent of similar garden design features found in many Ming and Qing dynasty landscape architectures that have been preserved to the present day.

Based on the research findings from the Erlitou Site's Palace No. 2 and the Yanshi Shangcheng site's Palace No. 4, and considering the spatial characteristics of the F1 and F2 palace foundations at the Panlongcheng site, it is noted that the F2 palace features passageways on both the eastern and western sides, while no other architectural remains have been discovered at the ends of the F1 and F2 palaces. This chapter hypothesizes that if the F1 and F2 palaces belong to the same complex, the F3 palace foundation may represent a northern corridor of the entire palace site, which would enclose and connect the two palaces. Consequently, this chapter further reconstructs the F1, F2, and F3 palaces as part of a two-courtyard layout with surrounding corridors, offering new perspectives and approaches for the study of ancient palace architectural landscapes.

Drainage facilities

During the excavation and research of the Panlongcheng site, archaeologists discovered that the drainage system of the palace ruins exhibits relatively regular characteristics. The drainage around the F1 palace is located around the base, forming a sloped configuration, which contributes a distinct aesthetic to the site's landscape.[222] The drainage of the F2 palace is like that of the F1 palace, demonstrating a certain degree of consistency in their landscape features. Archaeologists identified a segment of terracotta drainage pipes outside the eaves of the west gate of the F2 palace: this segment consists of 11 sections made of sand-tempered pottery, with lengths ranging from 46 to 55 centimetres, most measuring 49 centimetres. The pipes have a diameter of 24 centimetres and wall thickness between 1.8 and 2 centimetres, with decorative rope patterns on their surfaces (Figure 117). [223] This discovery provides significant

[222] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 56. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 56.

[223] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），

insights into the landscape characteristics of Panlongcheng Site.



Figure 117. Photograph of the Panlongcheng Site. (Source: captured by the author)

In the architectural remains of the Central Plains of China from the same historical period, ceramic drainage pipes are frequently found, as evidenced by their presence in multiple locations at the Yinxu Site, where drainage systems were composed of interconnected ceramic pipes. However, no evidence of dispersal drainage has been discovered in these structures. At the Panlongcheng archaeological site, fragments of ceramic shards were uncovered around the periphery of the F1 and F2 palace ruins. This has led some archaeologists to hypothesize that the palace platforms at Panlongcheng were originally surrounded by multiple layers of ceramic dispersal drainage systems. [224] From a landscape studies perspective, this is closely related to the region's high precipitation and humid environment in the Jianghan Plain area.

页 61. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 61.

[224] 湖北省文物考古研究所，*《盘龙城-1963-1994 年考古发掘报告 （上册）》*，（北京：文物出版社，2001），页 61. / The Hubei Provincial Institute of Cultural Relics and Archaeology, *The Panlongcheng Site Archaeological Excavation Report 1963-1994 (Volume I),* (Beijing: Cultural Relies Press, 2001), pp. 61.

Such elevated palace structures are equipped with drainage facilities, including catchment and piping systems, which significantly mitigate the threats posed by flood disasters to their landscape functionality. Additionally, these drainage systems offer valuable examples for studying the landscape adaptability of ancient architecture, illustrating the ingenuity of ancient people in harmonizing architecture with the natural environment.

Appearance of palace architecture in the Panlongcheng site

The floor plan of the F1 palace foundation ruins reveals that the interior of the palace is divided into four rooms. Each room features a door in the middle of the southern wall, with the two centrally located, larger rooms also having a rear door. Surrounding the foundation are remnants of large-radius eaves columns (Figure 118), indicating the presence of a colonnade around the exterior of these rooms, which contributes to a distinctive spatial hierarchy within the palace.

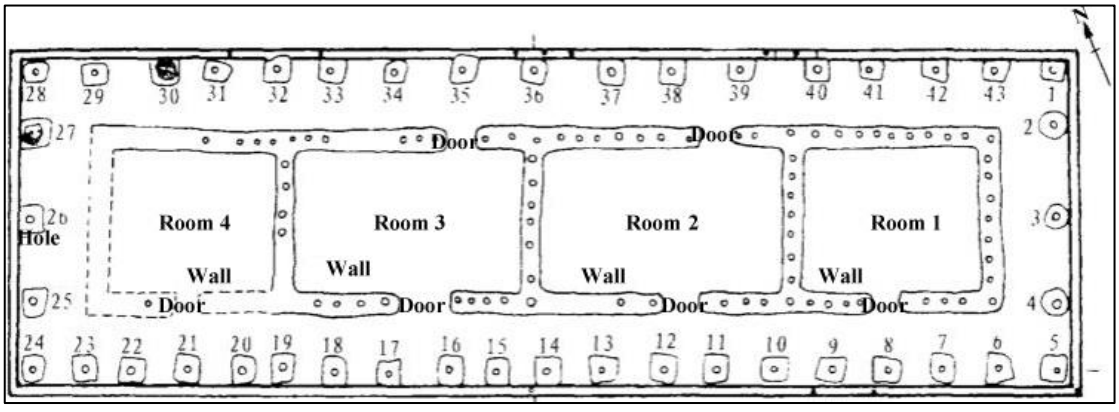


Figure 118. Floor plan of the Panlongcheng F1 palace (Source: 杜金鹏，〈盘龙城商代宫殿基址讨论〉，*《考古学报》*，02（2005），页 161-182. / Jinpeng Du, 'Discussion on the Shang Dynasty Palace Site at Panlongcheng Site', *Acta Archaeologica Sinica*, 02 (2005), pp. 161-182.)

In the ancient text *Artificer's Record (《考工记》)* from the Shang Dynasty, the main hall was described thus: 'The Yin people valued their buildings, with the hall constructed seven fathoms high, elevated three feet, and with four-pitched roofs.' [225] This suggests that Shang Dynasty palace buildings were typically constructed on a three-foot high earthen platform, featuring a four-pitched roof with relatively narrow double eaves. Given that the Panlongcheng palace is also a product of the Shang Dynasty, it is highly plausible that this roofing construction technique was applied to the Panlongcheng palace as well. Additionally, the ancient text *Ode of Dongjing (《东京赋》)* records that during the Shang Dynasty, most buildings had thatched roofs and were built on rammed earth foundations.[226] Thus, it is a reasonable hypothesis that the roof of the F1 palace was thatched, as was the custom at the time.

Based on its analysis, this study hypothesizes that the original appearance of the F1 palace site was a large palace constructed on a rammed-earth platform approximately 10 centimetres high. The palace featured dual narrow eaves made of thatch. Besides four internal rooms, the structure included surrounding corridors, with steps present on all four cardinal directions of the building. This architectural landscape not only reflects the characteristics of Shang Dynasty architecture but also provides a crucial reference for studying the spatial layout and architectural style of ancient palaces in this chapter.

Field Landscape

In Chapter Three, it was mentioned that during the Neolithic period, settlements in the Jianghan Plain were distributed in a dispersed manner, characterized by point and patch-like patterns. Surrounding these settlements were agricultural fields, with more distant areas consisting of

[225] *《考工记》*. / *Artificer's Record.*

[226] 张衡（汉），*《东京赋》*. / Heng Zhang (Han Dynasty), *Ode of Dongjing.*

expansive wilderness and mountainous regions. Due to the rudimentary tools available to Neolithic people and the sparse population, the land suitable for cultivation was limited. Consequently, agricultural fields were often non-contiguous and irregularly shaped. However, during the Bronze Age, with the influx of population from the Central Plains and advances in productivity, coupled with large-scale slave labour, it is hypothesized that contiguous agricultural fields began to emerge in some urban centres, such as Panlongcheng.

In the extant ancient texts, numerous articles can be found highlighting the significance of agriculture during the Zhou Dynasty. Examples of such articles include 'Zhou Hao' (周浩) in the Book of Documents (尚书) and 'Zhou Song' (周颂) in the Book of Songs (诗经). Agriculture held immense value during the Zhou Dynasty and consequently, any region that fell under the Zhou dynasty's political influence would witness the development of agriculture. This was true even for the Jianghan Plain. The city of Panlongcheng, situated in the lower reaches of the Han River and established by the Zhou dynasty in the Jianghan region, shared comparable emphasis on agriculture and land systems with the Central Plains region. The well-field system (井田制), which originated during the Shang Dynasty and reached maturity in the Zhou Dynasty, served as the prevailing land system in ancient Chinese society during that era.[227]

Over time, this system gradually declined in the Spring and Autumn Period due to the introduction of iron farming tools and the widespread adoption of ox ploughing, among other contributing factors. During the Western Zhou period, the land was geometrically divided into square plots through the construction of roads and canals, resulting in a formation resembling the Chinese character '井' (Jing). Consequently, it was named '井田' (Jingtian). The Jingtian land was under the ownership of the Zhou king and was

[227] 江林昌，<两周时期的农村公社与井田制问题补论>，*《江海学刊》*，04（2016），页 158–164. / Linchang Jiang, 'Extended Examination of the Rural Commune and Communal Land System within a Fortnight', *Jianghai Academic Journal*, pp. 159-168.

allocated for utilization by the common populace. The nobles were prohibited from engaging in the purchase, sale, or transfer of Jingtian plots and were required to pay a specified tribute. The nobles compelled the common people to engage in collective cultivation of the Jingtian, where private fields surrounded the public fields in the centre. However, fundamentally speaking, the well-field system (井田制) functioned as a form of land private ownership, even though during the Xia, Shang, and Western Zhou Dynasties, all land was considered state property.

The well-field system utilizes a grid-like pattern, reminiscent of a well, to partition farmland into multiple square plots with well-defined boundaries and water ditches. Each individual is responsible for cultivating approximately 100 mu (亩) of land, which is roughly equivalent to 70 acres in present-day measurements. [228] This 100-mu (亩) area is referred to as a 'Tian' (田), or one field, and it is worth noting that the character '田' (Tian) in oracle bone script originates from this term.

The well-field system further subdivides one well into nine square blocks, with eight of these blocks designated as private fields and cultivated by eight distinct households. The produce yielded from these private fields belongs exclusively to the cultivating households. Situated in the centre is the public field, which is collectively managed by the eight households. The income generated from the public field is then distributed to the noble class of the fief (Figure 119). [229]



Figure 119. Illustration of the well-field system (Source: created by the author)

[228] 1 mu (亩) ≈6.667 ㎡

[229] 牟发松，《唐代长江中游的经济与社会》，（武汉：武汉大学出版社，1989），页 9. / Fasong Mou, *Economy*

The well-field system possesses distinctive characteristics that set it apart from other agricultural forms. Firstly, it places a strong emphasis on the significance of cooperation and mutual assistance among farmers. By engaging in the sharing of resources and labour, this system guarantees that the burden of cultivating the entire field does not fall solely on a single family, thereby enabling all members of the well-field community to benefit from collective efforts. This highlights the interdependence and unity within the well-field community. Secondly, the land system associated with the well-field optimizes land and water resources through the enhancement of efficiency and productivity. The division of fields into smaller squares facilitates crop rotation and irrigation, thereby minimizing the losses incurred because of water evaporation and runoff. This approach enables the community to achieve multiple harvests within a single year, ensuring a steady and ample food supply. Thirdly, the well-field system embodies principles of social fairness. By granting equal shares of land and yields to each family, it prevents the emergence of rank or class distinctions among farmers.

The Jianghan Plain has long been characterized by its agricultural civilization focused on rice cultivation, a tradition that dates to the Neolithic Age. This region boasts a rich agricultural history that continues to be widely recognized in contemporary times. During the middle period of the Bronze Age, the Zhou Dynasty introduced the well-field system, which greatly expedited the process of land reclamation, particularly within the Jianghan Plain region. This study posits that, during the Zhou Dynasty, the urban areas would have encompassed extensive farmland, while the surrounding suburban regions would have also featured sizable agricultural fields. Conversely, the more remote and wilderness areas would likely have only contained sporadic pockets of farmland, as mountainous terrains were typically not utilized for cultivation purposes.

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and Society in the Middle Reaches of the Yangtze River during the Tang Dynasty, (Wuhan: Wuhan University Press, 1989), p. 9.

Within the expansive Jianghan Plain, a few cities are centred around Panlongcheng site, each with their own surrounding agricultural zones varying in width and characterized by contiguous farmland. Beyond these agricultural areas, there are additional regions where farmland is not contiguous. Within these agricultural zones, traces of dispersed villages can be found, with settlements becoming sparser as one ventures further from the cities. Eventually, these farmland areas gradually transitioned into pristine forests.

The land pattern of this nature experienced gradual transformations during the Spring and Autumn Period and the Warring States Period. The first notable change occurred with the rise in population and enhanced productivity, resulting in the continuous expansion of agricultural economic development in both scope and intensity. Consequently, the expanse of farmland began to witness a persistent growth and contiguous fields progressively extended outward. Concurrently, settlements saw an increase in density and the proliferation of cities. The previously untouched spaces between these cities were gradually subjected to human activity, eventually leading to their disappearance, thereby facilitating the amalgamation of previously fragmented agricultural regions into a cohesive unit.

Alongside the alterations in the land system, there were notable shifts in the configuration of fields as well. During the transition from the Western Zhou Dynasty to the early Spring and Autumn Period, the Chu state persisted in utilizing the Jingtian system. However, as the late Spring and Autumn Period unfolded, this system gradually disintegrated, giving rise to the establishment of private land ownership. Consequently, the physical appearance of fields underwent a gradual metamorphosis, manifesting in two distinct forms. Firstly, there emerged large and contiguous estates, predominantly possessed by the aristocracy and landlords of that era. Secondly, independent small plots of land emerged, typically cultivated by individual farmers. These two field arrangements, characterized by the intermingling of extensive estates and varying sizes

of self-cultivated plots, coalesced to form the field pattern observed in the Jianghan Plain during the late Spring and Autumn Period and the subsequent Warring States Period.

To comprehensively examine the agricultural landscape during the Spring and Autumn and Warring States periods, it is imperative to consider the cultivation techniques employed during that era, in addition to the mentioned field patterns. According to historical texts such as *the Records of the Grand Historian: Biographies of Usurers (《史记. 货殖列传》)* and *the Book of Han: Treatise on Geography (《汉书. 地理志》),* it is evident that the southern regions of China, until the Han Dynasty and beyond, primarily practiced slash-and-burn agriculture and water ploughing. This particular cultivation method involved the deliberate use of fire to clear weeds and prepare the land, resulting in the simultaneous eradication of undesirable vegetation, fertilization of the soil, and pest control. Subsequently, crops were planted and grown through the process of water ploughing, which entailed inundating rice fields with irrigation water to suppress weed growth. During the Bronze Age, rice remained the predominant crop in the Jianghan Plain, and the adoption of slash-and-burn and water ploughing techniques significantly influenced the visual characteristics of the cultivated fields. Nevertheless, it is important to acknowledge that not all cultivated land was continuously utilized; instead, a portion of fallow land exhibited an abandoned appearance, overgrown with weeds. [230] Conversely, the cultivated areas bore crops, reflecting the alternating transformation that transpired on the Jianghan Plain during that historical period.

[230] 牟发松，*《唐代长江中游的经济与社会》*，（武汉：武汉大学出版社，1989），页 10-16. / Fasong Mou, *Economy and Society in the Middle Reaches of the Yangtze River during the Tang Dynasty,* (Wuhan: Wuhan University Press, 1989), pp. 10-16.

The emergence of Royal Gardens

During the mid to late Bronze Age on the Jianghan Plain, the State of Chu experienced robust commercial and economic growth, bolstering its national strength. The population density gradually increased, ensuring significant assurance of essential commodities for the populace. Compared to the early Bronze Age, there was a qualitative leap in living conditions. Situated at the heartland of Chu's territory, the Jianghan Plain served not only as Chu's granary but also as a natural hunting ground for its nobility. Against this backdrop, the embryonic development of royal gardens for leisure and enjoyment began to emerge.

Firstly, it is essential to elucidate the origins of classical Chinese gardens. The embryonic form of classical Chinese gardens dates to the Shang Dynasty of the Bronze Age, as evidenced by the earliest written Chinese characters '囿' (You) and '台' (Tai).[231] During the Neolithic Age, hunting served as the primary means for primitive humans to acquire sustenance. However, as humanity transitioned into the Bronze Age, agricultural practices gradually supplanted hunting activities, becoming the predominant mode of production. During this period, the ruling class transformed hunting into a recreational activity aimed at reenacting ancestral lifestyles.[232] Given that hunting concurrently serves as both a leisure pursuit and a form of military training, it inherently combines recreational functionalities with military preparation.

In the Zhou Dynasty, the royal family possessed dedicated grounds for livestock grazing, where royal members frequently engaged in hunting activities. Such grounds were

[231] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 40. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 40.

[232] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 41. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 41.

referred to as ‘You’ (囿). [233] The earliest documented enclosure can be traced back to the ‘You’ (囿) on the Zhou Dynasty, estimated to have occurred around the 11th century BC. Descriptions of the King Ling’s ‘You’ (囿) are found in the *Book of Songs (《诗经》)*, specifically within the *Great Odes of the Kingdom (《大雅》)* section:

> In the sacred grove, the noble stag reclines, its form poised gracefully, while the white birds flutter gently. In the sacred marsh, the fish dart swiftly through the waters as the king observes their graceful movements.[234]

Within this vast area, to facilitate the habitation and movement of wildlife, it was necessary to plant trees and construct artificial water features, such as ditches and ponds.

Additionally, based on textual references from the *Xia Xiao Zheng (《夏小正》)*, fruit and vegetable cultivation were commonly practiced within these ‘You' (囿) areas. [235]

Consequently, it is plausible to envision that within these royal grounds, various animals roamed the forests, birds soared through the treetops, and waterfowl frolicked in the waters, presenting an ecological landscape reminiscent of nature.

Within the ancient book *Ritual of Zhou Dynasty (《周礼》),* there is a passage that depicts the concept of ‘You’ (囿):

> Inhabiting within an imperial garden, one finds respite within the detached

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[233] 周维权，*《中国古典园林史》（第三版)*，（北京：清华大学出版社，2008），页 41. / Weiquan Zhou*, History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 41.

[234] *《诗经,大雅》 / Book of Songs, Great Odes of the Kingdom.*

[235] *《大戴礼记，夏小正》 / Da Dai Li Ji, Xia Xiao Zheng.*

palace, where the serene ambience of miniature landscapes unfolds.[236]

This indicates that the 'You' (囿) also serves the function of providing recreational sightseeing opportunities. In this 'You' (囿) can be regarded as a large-scale hunting park constructed and managed by humans, typically delineated within a designated area, or enclosed by boundaries, possessing the rudimentary characteristics of a garden (Figure 120).

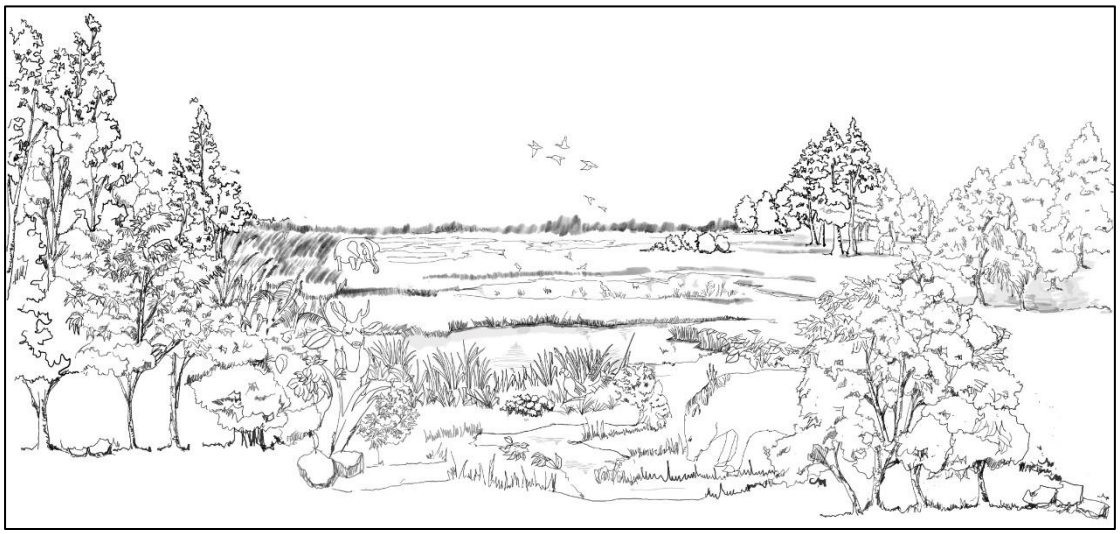


Figure 120. A speculative illustration of the hunting park landscape. (Source: hand-drawn by the author)

Apart from 'You' (囿), 'Tai' (台) serves as another origin of classical Chinese gardens. In the ancient book *the Spring and Autumn Annals of Master Lu (《吕氏春秋》)*, 'Tai' (台) is explained as a rectangular platform built with earth mounds. During the Bronze Age, there existed a distinctive architectural pattern known as elevated platform construction in the Jianghan Plain. This architectural style gradually emerged as a result of the local inhabitants adapting to the perennially humid and rainy environment of the Jianghan Plain. In addition to its practical functionality, the elevated platform also

[236] 周公旦（周），*《周礼，地官，囿人》* / Gongdan Zhou (Zhou Dynasty), *Ritual of Zhou Dynasty, Di Guan, You Ren.*.

provided an opportunity for people to ascend and enjoy panoramic views of the scenery. During the Zhou Dynasty, the elevated platform-style architecture became a temporary trend, with its role in leisurely sightseeing progressively elevated to become a prominent feature of palace and garden structures of the time. Often, such structures would be integrated with vegetation, forming a spatial environment centred around them (Figure 121).



Figure 121. Zhanghuatai Palace Site - Elevated Architectural Structure. (Source: captured by the author)

'Tai' (台) serves as another source for classical Chinese gardens. The ancient book *Spring and Autumn Annals of Master Lu (《吕氏春秋》)* provides an elucidation of 'Tai' (台), defining it as a square elevated platform constructed by piling up soil:

> The soil accumulates from all directions, thus forming what is referred to as an elevated platform.[237]

In the Neolithic era, a distinctive architectural pattern, known as elevated-platform architecture, emerged on the Jianghan Plain. Typically, houses were constructed atop

[237] 吕不韦（战国），*《吕氏春秋》* / Buwei Lu (Warring States Period), *Spring and Autumn Annals of Master Lu.*.

artificially elevated platforms, raising the main structure above the surrounding ground level. This architectural style evolved gradually, driven by the region's persistent dampness and high rainfall, prompting local inhabitants to adapt to their environmental conditions. Beyond its pragmatic function of mitigating adverse environmental factors, elevated-platform architecture afforded inhabitants an elevated vantage point for scenic observation. During the Zhou Dynasty, elevated-platform structures gradually became fashionable, assuming roles not only as functional dwellings but also as prominent features of imperial gardens and estates.[238] Such architecture often integrated with surrounding vegetation to shape a spatial environment centred around it.[239]

During the Spring and Autumn period as well as the Warring States period, the flourishing commerce and economy among various vassal states led to the proliferation of cities both large and small throughout the nation, and a considerable number of rural dwellers migrated to urban centres seeking livelihoods. The burgeoning urbanization, however, fostered an increasing detachment from natural surroundings. To seek respite from urban clamour, monarchs and aristocrats residing in cities began to commission the construction of estates in picturesque suburban locales near their palaces. Records within the historical book *Tradition of Zuo (《左传》)* document the establishment of such estates by the vassal lords during this era. Notably, Zhanghuatai, situated in the Jianghan Plain, served as a royal garden of recreational nature constructed by the king of the State of Chu. It stands as the earliest known royal garden unearthed by archaeologists within the Jianghan Plain region to date. [240]

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[238] 周维权，*《中国古典园林史》(第三版)*，(北京：清华大学出版社，2008)，页 42-43. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), pp. 42-43.

[239] 王崇礼，*《楚国土木工程研究》*，(武汉：湖北科学技术出版社，1995)，页 95-96. / Chongli Wang, *Research on Civil Engineering in the State of Chu.,* (Wuhan: Hubei Science & Technology Press, 1995), pp. 95-96.

[240] 湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，(北京：文物出版社，2005)，页 460. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), p. 460.

In 529 BC, the addition of the first true garden landscape in the Jianghan Plain region was realized with the establishment of a royal garden landscape known as Zhanghuatai. King Ling of Chu initiated the construction of Zhanghuatai in 535 BC, employing nationwide efforts that spanned six years for its completion.[241] Benefiting from the robust stature of the Chu state at that time, King Ling mandated that Zhanghuatai, crafted by artisans, not only incorporated all the features of the manors built by the Zhou royal family during the Eastern Zhou period but also encapsulated the cultural essence of Chu and the distinctive attributes of its natural surroundings.

The archaeological site is situated in the central-western region of the Jianghan Plain, characterized by a rich network of river systems. During the Bronze Age, this area fell within the Ancient Yunmengze Lake Group. Zhanghuatai is approximately 40 kilometres away from the capital city of the Chu state, Ji'nan City Site (Figure 122). [242]

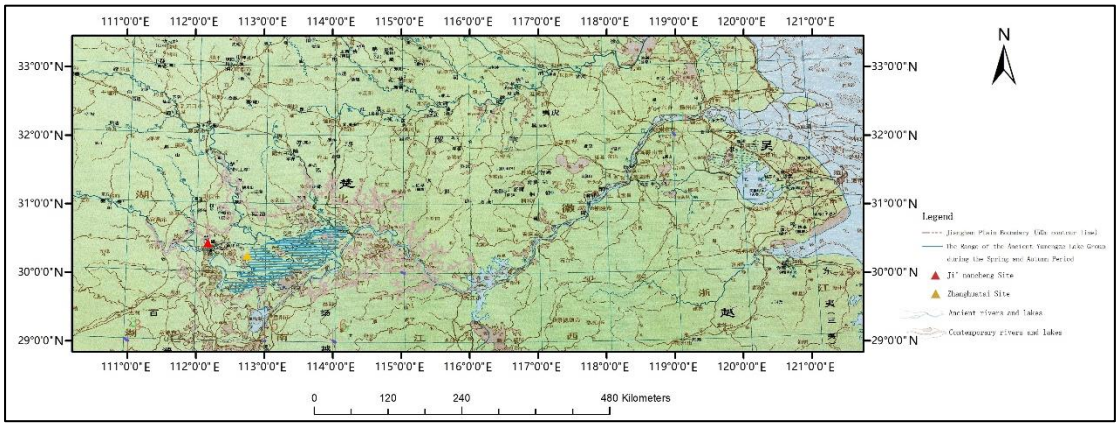


Figure 122. Positioning diagram of the Zhanghuatai Site. (Source: recreated by the author, based on the '谭齐襄,*《中国历史地图集-第一册》*,(北京:中国地图出版社,1993),页 29-30. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 29-30')

[241] 司马迁(汉),*《史记,楚世家》* / Sima Qian (Han), *Historical Records, Chu Shi Jia.*.

[242] 湖北省潜江博物馆,湖北省荆州博物馆,*《潜江龙湾:1987-2001 年龙湾遗址发掘报告(上)》*,(北京:文物出版社,2005),页 461. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), p. 461.

The climate in this region belongs to the subtropical monsoon humid climate, characterized by distinct seasons, abundant rainfall, and susceptibility to floods. Presently, the site area presents a water-town plain landscape with intertwining rivers and canals, crisscrossing embankments, low-lying paddy fields, and extensive fish ponds, along with numerous lakes of varying sizes (Figure 123). Archaeological excavations conducted by researchers have revealed that the total area of the site is approximately 2 million square metres (Figure 124). [243] Daoyuan Li, a renowned geographer during the Northern and Southern Dynasties period, described Zhanghuatai in his work as follows: Its main structure stands about33.3 metres tall, occupying an area of approximately 166.7 square metres. Constructed on the bank of a lake, the project was of considerable magnitude, requiring the mobilization of national resources, and it took six years to complete under the leadership of King Ling of Chu. [244]



Figure 123. Aerial imagery of the surroundings of the Zhanghuatai archaeological site. (Source: captured by the author)

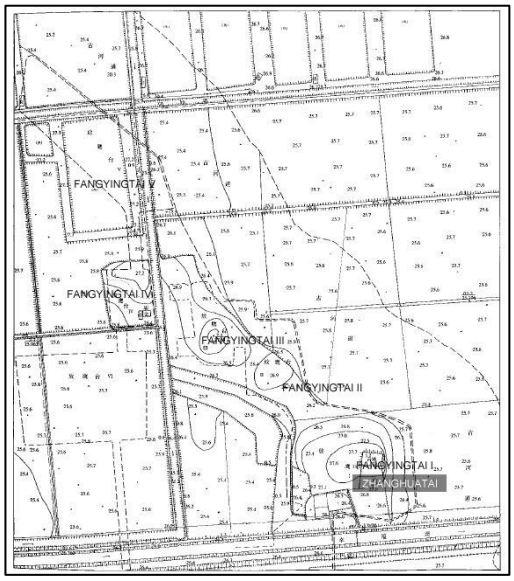


Figure 124. The topographic map of the Longwan archaeological site. (Source: recreated by the author, based on the ‘湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 11. / Museum of Qianjiang, Museum of Jingzhou, Longwan of *Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), p. 11.)

[243] 方酉生，<试论湖北潜江龙湾发现的东周出国大型宫殿遗址>，*《孝感学院学报》*，01（2003），页 24-26，（第 26 页）. / Yousheng Fang, ‘Proofs for Chu Palace Relic of Eastern Zhou Dynasty Unearthed at Longwan Qianjiang, Hubei’. *Journal of Xiaogan University*, 01 (2003), 24-26 (p. 26).

[244] 郦道元（南北），*《水经注,沔水》* / Daoyuan Li (Northern and Southern Dynasties), *Commentary on the Waterways Classic, Mian Shui.*

The palace architecture of the State of Chu typically involves the construction of elevated platforms upon which building complexes are erected. Each individual structure features multi-tiered roofs, showcasing a monumental and aesthetically pleasing image.[245] The Zhanghuatai Site is a royal garden encompassing multiple architectural complexes, with a total area of 13,000 square metres, primarily composed of elevated platforms, corridors, courtyards, squares, roads, and pavilions (Figure 125).[246] According to archaeological excavations, the main architectural complex is situated on top of a rectangular platform measuring approximately 300 metres in length and 100 metres in width, supporting four interconnected buildings. The largest of these buildings measures approximately 45 metres in length, 30 metres in width, and 30 metres in height, comprising three levels, each adorned with splendid decorations, intended for the residence of King Ling of Chu and other royal nobles.[247] An overview of the panoramic view of the Zhanghuatai Site (Figure 126) reveals the typical layout of southern water town palatial estates, with a north-south gradient arrangement; interconnecting corridors traverse between the three-tiered platforms within the terrace, while a shell road surrounds the eastern, southern, and western sides externally. To the south lies a spacious square, while to the north is a serene courtyard adorned with a combination of corridors and courtyards, and the perimeter of the terrace is enveloped by curved corridors combined with pavilions (Figure 127). To the east, the terrace extends directly to the ancient Han River, while to the west lies the shimmering waters of Chujia Lake.

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[245] 王崇礼，*《楚国土木工程研究》*，（武汉：湖北科学技术出版社，1995），页 99-101. / Chongli Wang*, Research on Civil Engineering in the State of Chu.,* (Wuhan: Hubei Science & Technology Press, 1995), pp. 99-101.

[246] 湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 54-55. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), pp. 54-55

[247] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 59. / Weiquan Zhou*, History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 59.

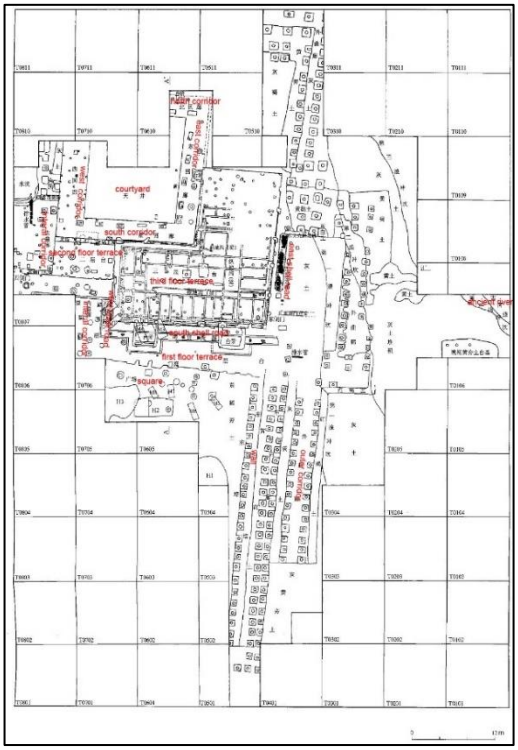


Figure 125. The topographic map of the Longwan archaeological site. (Source: recreated by the author, based on '湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 45. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I)*, (Beijing: Cultural Relics Publishing House, 2005), p. 45.)



Figure 126. Aerial photograph of the main buildings at the Zhanghuatai archaeological site. (Source: captured by the author)



Figure 127. The detailed diagram of the Zhanghuatai archaeological site. (Source: captured and recreated by the author)

Aerial photographs of the site area show that the Zhanghuatai site is surrounded by rivers and lakes. During the Bronze Age, due to the continuous elevation of the riverbeds of the Yangtze and Han rivers, along with the rising groundwater levels and frequent flooding, the extent of the Ancient Yunmengze Lake Group expanded to this region. The terrain near the site area gradually transformed from hills to a landscape characterized by a mix of hills and lakes. The specific location of Zhanghuatai lies on the Jingjiang Delta, along the northern boundary of the Ancient Yunmengze Lake Group.[248]

The ancient book *Discourses of the States (《国语》)* contains a passage about Zhanghuatai, further substantiating these observations. It records that King Ling of Chu did not adhere to the principles of good governance, and his ministers' warnings and

[248] 湖北省潜江博物馆，湖北省荆州博物馆，*《潜江龙湾：1987-2001 年龙湾遗址发掘报告（上）》*，（北京：文物出版社，2005），页 4. / Museum of Qianjiang, Museum of Jingzhou, *Longwan of Qianjiang: Excavation Report of the Longwan Site 1987-2001, (I),* (Beijing: Cultural Relics Publishing House, 2005), p. 4.

admonitions fell on deaf ears. He constructed terraces and pavilions at Zhanghua, carved tombs from rock and diverted the waters of the Han River to the site, creating a scenic waterfront in an imitation of Shun's tomb.[249] This historical description corroborates the geological and environmental context identified through the analysis of the site's surrounding landscape.

These towering architectural complexes, integrated with the natural rivers and lakes, naturally form a harmonious blend of dynamic and static garden landscapes. This thesis contends that within this design ethos, designers have not only considered the logistical needs of the royal nobility of the Chu Kingdom for water transportation and aquatic leisure activities from the capital to Zhanghuatai, but have also capitalized on water features to accentuate the grandeur of the architectural ensemble. In the construction of Zhanghuatai, designers introduced large-scale hydraulic engineering, employing the artificial excavation of canals to channel natural watercourses into the garden area. Such an approach not only expands the possibilities for landscaping within the garden but also facilitates waterborne transportation. The discovery of Zhanghuatai not only reflects the Chu Kingdom's advancement in architectural science but also showcases the high artistic skill of the ancient inhabitants of the Jianghan Plain in refining and encapsulating natural aquatic landscapes.

In Zhanghuatai Site, the employment of shell roads merits attention. Situated on a platform, these shell roads exhibit characteristics observable through on-site examination: the shells, varying in thickness and size, are predominantly white, with their apertures facing downward and snugly interlocked within the subsoil of the roadbed (Figure 128). Owing to historical conflicts, a significant portion of shell roads were transformed into charcoal due to the burning of structures, resulting in limited

[249] 左丘明（春秋），*《国语，吴语》* / Qiuming Zuo (Spring and Autumn Period), *Discourses of the States, Wuyu.*

quantities of intact shells discovered solely within archaeological excavations.[250] These pristine shells, possessing a lustrous white hue and intricate fish-scale patterns, serve as elegant and pure symbols. The design and construction of shell roads represent a vivid manifestation of the imaginative and romantic inclinations of the ancient inhabitants of the Jianghan Plain during the Bronze Age.



Figure 128. Shell Road Detailed Image. (Source: captured by the author)

The functional requirements of hunting animals and appreciating plants by the royal nobility also play a significant role that Zhanghuatai needs to play. In the royal garden of Zhanghuatai, the abundance of animal and plant resources is self-evident. According to archaeologists' findings, during the Bronze Age, the Jianghan Plain had a variety of animals, mainly classified into three categories: domestic animals, wild animals, and fish. Among them, domestic animals mainly included water buffalo, goats, pigs, chickens and dogs; wild animals mainly comprised roe deer, wild boar, sparrows, pheasants and white pheasants; and fish mainly consisted of carp, crucian carp, grass carp, silver carp and catfish. In addition to these animals, the local area, as recorded in Yuan Qu's (屈原) *Song of Chu (《楚辞》)* was inhabited by carnivorous animals such

[250] 陈跃钧，<楚章华台考>，*《考古学研究》*，00（2003），页 692-700，（第 696 页）. / Yuejun Chen, 'The examination of Chu Zhanghuatai'. *A Collection of Studies on Archaeology'*, 00 (2003), 692-700 (p. 696).

as tigers, leopards, jackals and bears; herbivorous animals such as elephants, rabbits and rhinoceroses; and omnivorous animals such as apes and monkeys. [251] These exotic birds and beasts not only enriched the spiritual life of the nobles of the Chu state but also added vitality to the heavily guarded royal gardens.

In terms of botanical diversity, examination of the materials used in burial sites and accompanying botanical remains within graves from the Bronze Age in the Jianghan Plain provide an insight into the prevalent tree species in the region. These include species such as elm, catalpa, boxwood, Chinese holly, lime, walnut, persimmon, jujube, pear, Chinese quince, maple and Chinese catalpa, among others. Additionally, botanical remains such as citrus peels, cherries, pumpkin seeds, beans, Sichuan pepper, fennel, water chestnut, water caltrop, lotus root, arrowhead, water spinach and ginger have been identified. It is evident that the topographic vegetation of the Zhanghuatai site during the Bronze Age comprised a diverse array of plant species, including trees, shrubs, herbs and aquatic plants, contributing to a rich spatial hierarchy reminiscent of contemporary botanical landscaping patterns as found in parks. A passage in the ancient book The *Song of Chu (《楚辞》)* describes how artisans in the Chu kingdom would create artificial landscapes resembling natural water scenes around palace structures:

> Sitting within the hall, peering over the balustrade, facing the winding pond, where lotus blossoms begin to emerge amidst a blend of water chestnuts and water lilies.[252]

Consequently, it is hypothesized in this study that during the construction of the Zhanghuatai site, the Chu people would carve artificial ponds in front of the structures

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[251] 吴欣，李丽娟，<从楚文化的视角探讨楚园林的艺术特色-从楚文化的发祥地荆楚地区说起>，*《广东园林》*，04（2016），页 33-36，（第 35-36 页）. / Xin Wu, Lijuan Li, 'Artistic Features of Chu Garden from the Perspective of Chu Culture: A Case Study of Jingchu Area as the Cradle of Chu Culture'. *Guangdong Landscape Architecture'*, 04 (2016), 33-36 (pp. 35-36).

[252] 屈原（战国），*《楚辞，招魂》* / Yuan Qu (Warring States Period), *Song of Chu, Zhao Hun.*

and plant aquatic species such as water spinach and arrowhead to enhance the aromatic ambiance within the buildings whenever there was a breeze.

From this analysis, it is evident that Zhanghuatai exhibits not only architectural styles similar to those of the Central Plains region but also embodies distinct local characteristics and innovations. During the Bronze Age in the State of Chu, artisans not only assimilated the garden-making concepts of the Central Plains culture but also incorporated elements such as elevated wooden structures and 'You' (囿) into the construction of Zhanghuatai Site. They introduced a diverse range of flora and fauna, enabling royal nobility to simultaneously engage in hunting and leisurely strolls within the gardens, serving both functional and recreational purposes.

Meanwhile, artisans of the State of Chu employed the natural features of the Jianghan Plain, integrating natural water systems into the entirety of the royal garden area. On one hand, this enriched the water features within the garden, providing a majestic backdrop to the architectural ensemble. On the other hand, it facilitated the creation of an internal water transport system within the garden, as well as connections to external waterways. This enabled members of the Chu royal household not only to fulfil their needs of direct waterborne transportation from the capital of Chu, Jinan City, to Zhanguatai, but also to tour the entire Zhanghuatai from boats, thereby introducing a new mode of garden exploration. Zhanghuatai site, as a landscaped component of the royal garden, as it encapsulates and refines the natural elements of its surroundings.

Some scholars speculate that Zhanghuatai was not merely a garden where the Chu king resided and enjoyed leisure, but also served as the headquarters of the Chu navy. By overlaying the topographical map of Zhanghuatai with the extent of the Ancient Yunmengze Lake Group during the Spring and Autumn Period and the Warring States

Period (Figure 129), this study reveals that Zhanghuatai was connected to the Han River to the north and the Xia River to the south, its surroundings encompassed by lakes during the flood season. Marking the territory of the Wu state on the map, it becomes evident that extensive water bodies separated the states of Chu and Wu. So this study posits that during the Bronze Age, Chu's military campaigns against Wu necessitated the utilization of naval forces. It is reasonable to assume that Chu's navy conducted training exercises on the lakes near this royal garden, which was closer to Wu's territory. On one hand, Zhanghuatai, with its developed waterways and extensive lakes, could accommodate a large number of naval vessels, and utilizing it as a training ground for the Chu navy would enable them to reach Wu's territory in a shorter distance. On the other hand, it could also serve as a secure barrier between the Wu state and the capital of Chu, Ji'nan City Site, ensuring the safety of this place.

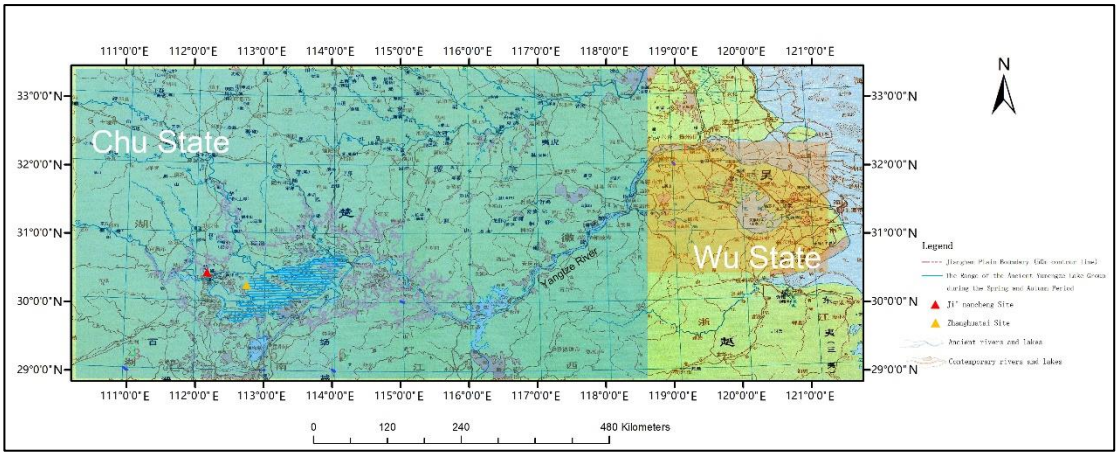


Figure 129. The map encompassing the territories of the states of Chu and Wu. (Source: recreated by the author, based on the '谭齐襄，*《中国历史地图集-第一册》*，（北京：中国地图出版社，1993），页 29-30. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 29-30')

In summary, Zhanghuatai site is a multifunctional royal garden that integrates hunting, leisure, residence, and naval exercises. Founded by King Ling of Chu (楚灵王) in the heartland of the Jianghan Plain, this royal garden represents a more comprehensive and

functional large-scale royal garden system compared to contemporaneous gardens in the Central Plains region. Not only is Zhanghuatai the first true garden in the history of the Jianghan Plain, but also, due to its vast scale, rich functionality, and high technological requirements, it represents a significant milestone in the development of Chinese gardens. Its construction model and principles laid the groundwork for subsequent garden construction and continue to influence contemporary practices.

Conclusion

In summary, this chapter employs GIS to analyse the micro-topographical environment, determine settlement construction methods, and elucidate various settlement distribution systems. It reveals the emergence of numerous settlements with diverse functions. Subsequently, using archaeological literature analysis, the chapter examines the water systems within the Ji'nan City site, uncovering how people of that era adapted and transformed nature in accordance with natural conditions. Historical literature analysis, supported by numerous ancient texts, establishes that although royal gardens in the Jianghan Plain were in their nascent stages, they had a significant impact on subsequent royal gardens. Together, these analyses form the chapter's conjectures about the landscape development stages of the Jianghan Plain during the Bronze Age. These methods may have limitations, though, as the integration of these approaches allows only a limited vertical analysis of landscape elements. Comparative analysis with other regions from the same period is constrained due to the fragmented nature of Chinese states during the Bronze Age, which complicates more systematic comparisons and results in a reliance on comparisons with related elements.

In the context of agriculture, fields during the new era were characterized by their irregularity and sparsity, with extensive forest boundaries between settlements. However, during the mid-Bronze Age, the expansion of arable land increased

significantly, leading to a gradual reduction of primordial forests between cities, and in some cases, their complete disappearance. This process resulted in the consolidation of previously fragmented agricultural areas into larger, continuous expanses. By the end of the Bronze Age, the implementation of the well-field system further altered the landscape: the noble class possessed large, contiguous estates, while ordinary farmers were limited to smaller plots of land. This shift brought about a new agricultural configuration, where vast estates owned by the nobility were interspersed with numerous plots of varying sizes owned by smallholders, collectively creating a distinctive agricultural pattern on the Jianghan Plain. The increase in population and the advancement of productivity have prompted individuals to expand the scale of land cultivation, thereby further enhancing agricultural production. In certain areas, there has also been the initiation of the construction of cities, roads, and other infrastructural developments. As a result, in some regions, the original natural landscapes have gradually been replaced by human-made landscapes, such as farmlands and settlements.

In terms of settlement morphology and scale, Neolithic settlements were relatively dispersed, lacking a distinct hierarchical system. In contrast, during the Bronze Age, a multi-tiered settlement system gradually emerged, with the Yangtze River's main course serving as the core and its tributaries as supporting axes. This period saw tighter inter-settlement connections and the development of hierarchical distinctions, leading to the differentiation between central and peripheral settlements. Early Bronze Age settlements were predominantly located along natural watercourses and were strategically established on ‘high grounds’ or ‘plains.’ Notably, some regional central settlements, such as Panlongcheng site, emerged as significant political, economic, and cultural hubs in the Jianghan region due to their large scale and complex construction methods. During this time, numerous smaller settlements also developed in the eastern and southern parts of the Jianghan Plain, predominantly in low mountain and hilly areas, creating a relatively independent and diverse settlement distribution system.

From the mid-Bronze Age onwards, the state of Chu initiated extensive development and construction in the Jianghan Plain, leading to the rise of urban centres. As Chu's development and control over the Jianghan Plain intensified, the region saw an increase in urban settlements. The activities of the Chu people began to extend into the central regions of the plains, accompanied by an increase in the remnants of Chu culture in the eastern areas. This indicates a significant expansion of human activities into the interior of the plains. Some originally minor cities or important habitation sites evolved into sizable urban centres. For instance, Yingdu (Ji'nan City) of the Chu state became a major political, economic, and cultural centre, characterized by its large scale and significant population. To address flood risks and optimize water resource utilization, extensive water management infrastructure, including moats and drainage channels, was developed within these cities. These hydraulic facilities played a crucial role in flood control, agricultural irrigation, and transportation, and formed important defensive barriers for the cities.

In the field of architecture, Neolithic societies had already developed housing, predominantly characterized by simple square or rectangular floor plans. By the Bronze Age, with ongoing advancements in productivity and further social stratification, a hierarchical structure in architecture began to emerge, leading to the construction of palace buildings. These palaces, as symbols of royal power and status, embodied rich cultural meanings. The mid-Bronze Age palaces reflected a reverence for the cosmos and deities, as well as an emphasis on the sanctity of imperial authority. These cultural symbols were inherited and further developed in subsequent palace architecture, becoming integral to traditional Chinese culture.

For example, the 'front hall and back residence' (前宫后寝) system established during this period was inherited and evolved in later palace architecture. The 'front hall' was designated for the emperor's official duties and ceremonial events, while the 'back

residence' served as the living quarters for the emperor and his consorts. This distinct functional zoning not only met the practical needs of palace architecture but also adhered to feudal ritual norms, exerting a long-lasting and stable influence on the layout and function of ancient Chinese palaces.

During this period, there was an emphasis on the central axis layout in palace architecture, a concept that profoundly impacted the planning of future palaces. Subsequent palace designs often adhered to strict axial symmetry to highlight the central position of the palace and the supreme nature of imperial authority, with the existing Forbidden City in Beijing serving as a prime example.

During the mid-Bronze Age, the Chu Empire on the Jianghan Plain developed high platform architecture, which later became a significant element in the pursuit of grandeur and majesty in palace construction. By constructing wooden structures on elevated rammed earth platforms, they achieved the appearance of tall buildings. The elevated platforms, supporting clustered single-story houses, created a façade reminiscent of multi-story large edifices, reflecting the era's religious beliefs and political systems. In contemporary regions outside the Jianghan Plain, other states also adopted high platform architecture, building their palaces on these elevated bases. This architectural style not only signified the authority of the rulers but also served practical purposes, such as preventing moisture and enhancing the living environment. Additionally, it increased the defensive capabilities of the palaces. This tradition of high platform construction is evident in later royal palaces and significant structures, such as the Beijing Forbidden City, where the palace buildings are also situated on elevated bases.

In addition, royal gardens in the Jianghan Plain during the Bronze Age began to emerge

in their nascent form. The royal gardens of this period were relatively simple in design, exemplified by the Zhanghuatai Site, which primarily utilized natural features such as lakes, hills, and forests as a foundation for preliminary utilization and modification. In contrast, regions outside the Jianghan Plain, such as the Gusutai Site (姑苏台) in Suzhou, represented more luxurious recreational gardens of the Bronze Age. Despite being in different areas, these contemporary royal gardens exhibited certain similarities. For instance, they all included ‘parks’ for hunting, where animals were enclosed for the amusement of emperors and nobles, as well as spaces designated for rituals, which might feature simple structures or elevated platforms. Notably, as history progressed, later royal gardens continued to embody this characteristic of utilizing natural landscapes. For example, the Summer Palace of the Qing Dynasty, located in the western suburbs of Beijing, was designed to harmonize with the natural topography of the Western Hills and Kunming Lake, resulting in a grand and aesthetically pleasing garden landscape.

Overall, prior to the Bronze Age, human modification of the natural landscape in the Jianghan Plain was relatively minimal and predominantly concentrated in elevated or more habitable areas, such as mound sites, with agricultural development still in its nascent stages. However, with the advent of the Bronze Age, increased population and advancements in productivity led to a gradual intensification of human impact on the landscape. During this period, there was a significant expansion of land reclamation, agricultural production, and the construction of infrastructure such as cities and roads, resulting in the gradual replacement of the region's original natural landscapes with agricultural fields and settlements.

Chapter 5. From the Qin Dynasty to the Yuan Dynasty (221BC-1368): Hydrological Environment, Land Reclamation and Religious Landscapes

Introduction

Following the Bronze Age, the Qin state, located in western China, utilized military force to sequentially annex six states, including Chu, culminating in the unification of China in 221 BCE. At this point, China emerged as a centralized empire. During the final two centuries of the Warring States period, political fragmentation was a superficial phenomenon; beneath this facade lay a culturally unified China. With the establishment of the Qin dynasty, China's economic focus gradually shifted from the north to the south. However, throughout the approximately 1,500 years spanning from the Qin to the Yuan dynasties, the Jianghan Plain did not appear to be the primary beneficiary of this economic transition. In contrast, other southern regions, such as Jiangnan, likely experienced more rapid development. Although the Jianghan Plain boasted fertile land and abundant water resources, its agriculture development began to slow down during the period from the Qin to the Yuan dynasties.

The decision to encompass the landscape development spanning approximately 1,500 years from the Qin Dynasty to the Yuan Dynasty within a single chapter was driven by two primary considerations. First and foremost, the historical documentation and research pertaining to the Jianghan Plain during this period, from the Qin Dynasty through the Tang and Song Dynasties and into the Yuan Dynasty, is relatively sparse.[253] Secondly, because of the long distance from the present day, coupled with the

[253] 张正明，刘玉堂，*《湖北通史-先秦卷》*，（武汉：华中师范大学出版社，1999），页：总序 8. / Zhengming Zhang, Yutang Liu, *General History of Hubei: The Pre-Qin Volume,* (Wuhan: Central China Normal University Press, 1999), p. General Preface 8.

widespread of wars in that period, which led to the obvious lack of well-preserved landscape structures on the Jianghan Plain. Consequently, the investigation of archaeological excavation reports is crucial for tracing the historical landscape. The current focus of archaeological work in the Jianghan Plain centres primarily on the Neolithic and Bronze Ages, so there are a limited number of archaeological findings relevant to the period from the Qin to the Yuan Dynasties. Taken together, these factors indicate that this timeframe does not provide sufficiently comprehensive evidence for substantiating the landscape evolution across various historical dynasties.

In addressing these issues, this chapter posits that the relatively low population density of the Jianghan Plain throughout much of the period from the Qin to the Yuan dynasties may be a contributing factor. Particularly before the Tang dynasty, the region along the middle and lower reaches of the Yangtze River was characterized by sparse population due to ongoing conflicts. Consequently, the economic development of the Jianghan Plain was comparatively limited, and much of the area remained in a relatively primitive state.[254] It was not until the gradual development of the Jianghan Plain during the Tang and Song dynasties, marked by an increase in embankment and reclamation activities, that the population began to rise, leading to a diversification of socio-economic activities and a corresponding increase in relevant historical documentation. It was only after the Tang and Song dynasties that the Jianghan Plain entered a phase of explosive economic growth, eventually becoming a significant centre of taxation throughout subsequent Chinese dynasties.

Although the landscape development of the Jianghan Plain during the Qin to Yuan dynasties entered a period of stagnation compared to the Neolithic and Bronze Ages, changes in this region's landscape remain traceable. As previously mentioned, the

[254] 荣蓉，<江汉平原南部居民与聚落研究>，（硕士论文：华中科技大学，2010）. / Rong Rong, Study of Residents and Settlements in Southern Jianghan Plain, (Master Thesis: Huazhong University of Science and Technology, 2010).

Jianghan Plain is situated within the floodplain of the Yangtze River and the Han River. This raises pertinent questions regarding how the inhabitants of this area responded to the flooding disasters caused by these rivers, how they adapted to the low-lying and muddy agricultural environment, and how they achieved a harmonious coexistence with this natural setting. It has already been noted that agricultural practices began to take shape in this region as early as the Neolithic period. So during the approximately 1,500 years from the Qin to the Yuan dynasties, how did human ingenuity facilitate the evolution of water conservancy projects on the Jianghan Plain from their nascent stages to maturity, ultimately leading to the development of a distinctive rural landscape model? The spatial distribution and morphological characteristics of rural settlements during this period will also be a focal point of discussion in this chapter.

The period between the Qin and Han dynasties and the Tang dynasty, known as the Wei, Jin, Southern and Northern Dynasties, represents a particularly fragmented and tumultuous era in Chinese history. This period serves as a pivotal point for the integration of diverse cultures. During this time, Chinese politics underwent significant upheaval, resulting in numerous conflicts and extensive migrations among various ethnic groups.[255] The large-scale movement of populations facilitated the blending of different cultures within China. This period also witnessed a profound intellectual liberation and the infiltration of foreign cultures, which began to exert influence on indigenous Chinese culture. In terms of landscape, the impact of religious culture is particularly noteworthy.[256]

The influence of Buddhist culture on the landscape of the Jianghan Plain during the

[255] 傅晶，王其亨，*《魏晋南北朝园林史探析》*，（天津：天津大学出版社，2018），页 20-21. / Jing Fu. Qixiang Wang*, Analysis of the History of Gardens in the Wei, Jin, Southern and Northern Dynasties,* (Tianjin: Tianjin University Press, 2018), pp. 20-21.

[256] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 157-159. / Weiquan Zhou*, History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), pp. 157-159.

historical period from the Qin Dynasty to the Yuan Dynasty is primarily evident in religious architecture, such as temples and pagodas. Temples, significant manifestations of the Buddhist faith, typically attract attention through their grand and solemn architectural styles. Throughout the Jianghan Plain, numerous temples are distributed across various locales, contributing to a distinctive visual landscape in the region. Pagodas, as a unique architectural form, are often constructed in proximity to or within temples, serving as an integral component of these religious structures. On the one hand, pagodas symbolize the historical and cultural heritage of a particular area, embodying rich religious and historical narratives; on the other hand, as towering edifices, they emerged as cultural landmarks within a vast plain during an era devoid of modern high-rise buildings. Consequently, the significant development and diversification of religious landscapes during the Wei, Jin, and Southern and Northern Dynasties will be another focal point of discussion in this chapter.

The Evolution of the Hydrological Environment

Yunmengze's changes

In contemporary geomorphology, the Jianghan Plain is characterized as a typical interfluvial lowland floodplain, marked by a network of rivers and a dense distribution of lakes, interspersed with numerous depressions. During the Song Dynasty, large lakes, such as Hong Lake, had not yet formed, and the central areas of these low-lying regions were predominantly occupied by numerous small lakes, which exhibited a pearl-like distribution. [257] As the geographic landscape evolved, the ancient lakes of the Yunmengze region experienced both eastward migration and contraction, leading to the

[257] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 350-351. / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), pp. 350-351.

fragmentation into smaller wetlands (Figure 130).[258] Over time, the fluvial dynamics became increasingly stabilized, and the Jianghan Plain gradually emerged as a significant area for human activities.

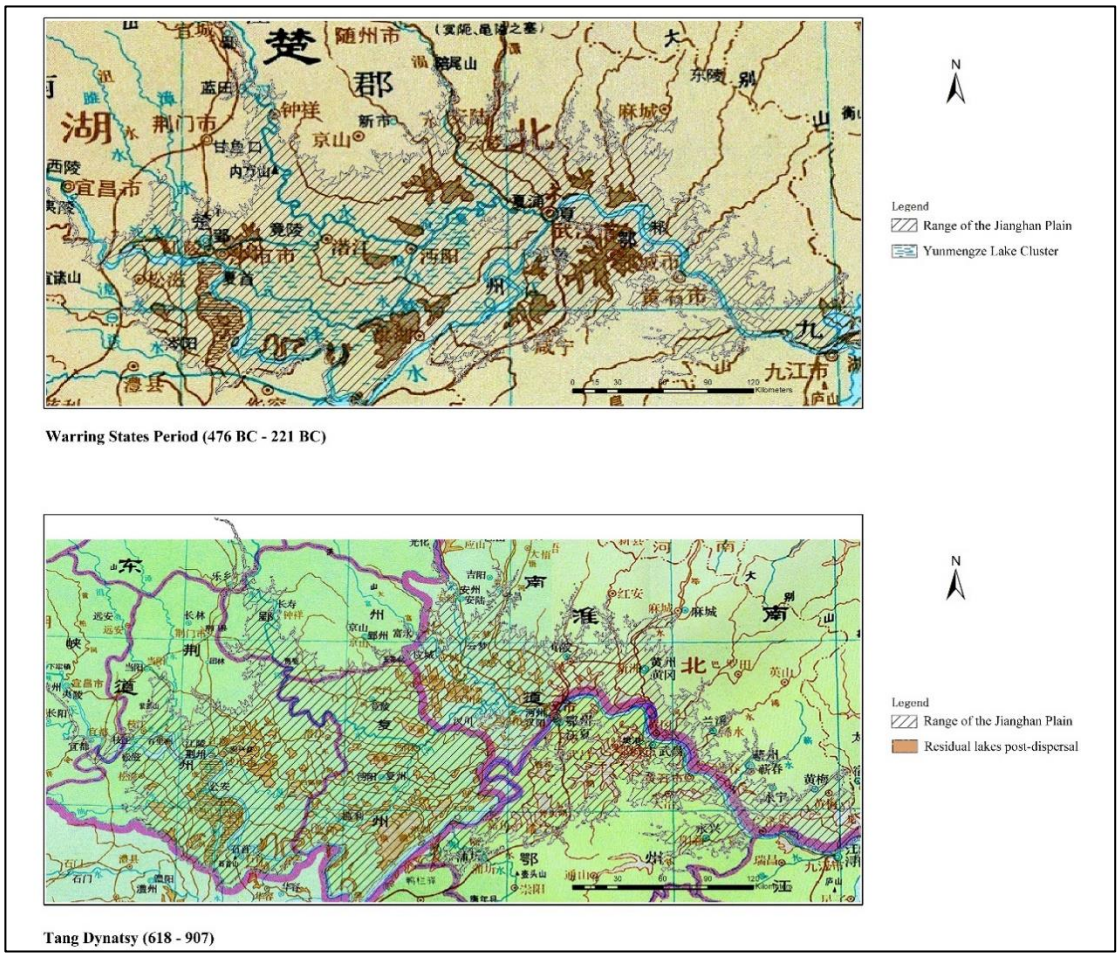


Figure 130. Comparison diagram of the peak period of the Yunmengze lake cluster and its subsequent disintegration (Source: recreated by the author, based on the '谭齐襄，*《中国历史地图集-第一册》*，（北京：中国地图出版社，1993），页 45-46. / Qixiang Tan, *The Historical Atlas of China – Volume 1*, (Beijing: China Cartographic Publishing House, 1993), pp. 45-46'; and '谭齐襄，*《中国历史地图集-第五册》*，（北京：中国地图出版社，1993），页 26-27. / Qixiang Tan, *The Historical Atlas of China – Volume 5*, (Beijing: China Cartographic Publishing House, 1993), pp. 26-27')

[258] 张修桂，<云梦泽的演变与下荆江河曲的形成>，*《复旦学报（社会科学版）》*，2（1980），页 40-48. / Xiugui Zhang, 'The Evolution of Yunmengze and the Formation of the Lower Jingjiang River Meander', *Fudan Journal (Social Sciences Edition)*, 2 (1980), pp. 40-48.

To date, the combined effects of human activities and natural factors have led to the disappearance of several lakes in the Jianghan Plain (Figure 131). The sedimentation in the Yangtze River has contributed to the gradual reduction of the surface area of these wetlands, while anthropogenic hydraulic projects, such as the construction of embankments and the excavation of drainage ditches, have further expedited the desiccation of the original lake basins.

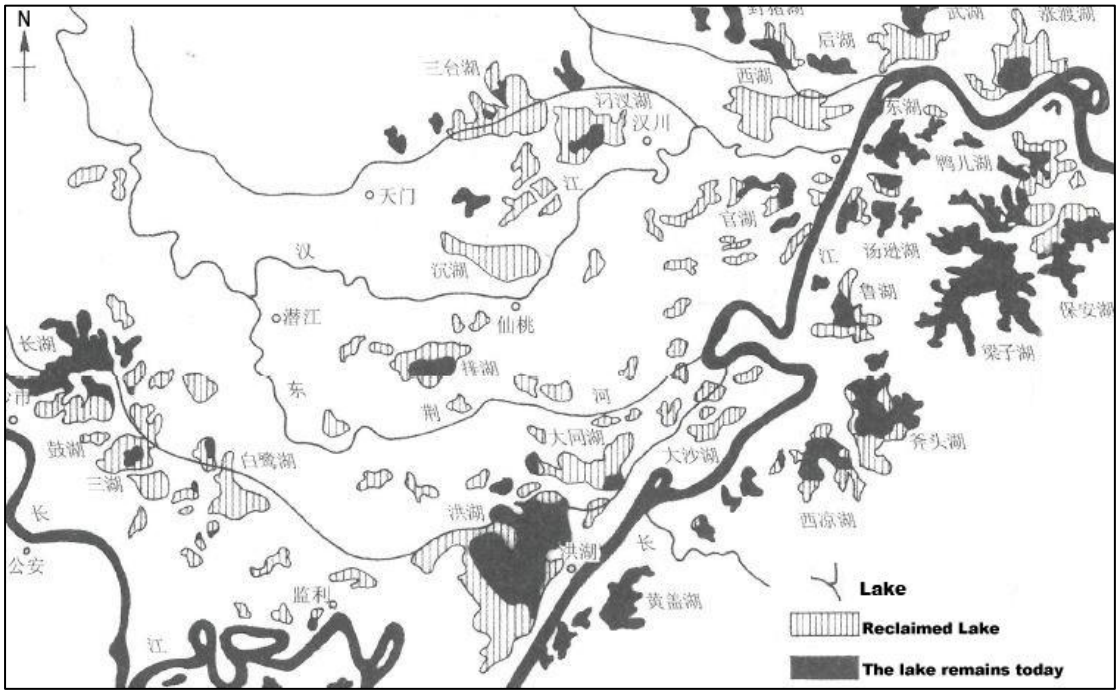


Figure 131. Schematic Representation of Lake Reclamation and Decline in the Jianghan Plain (Source: 徐瑞瑚，谢双玉，赵艳，〈江汉平原全新世环境演变与湖群兴衰〉，*《地域研究与开发》*，4（1992），页 52-56. / Ruihu Xu, Shuangyu Xie, and Yan Zhao, 'The Holocene environmental changes and the rise and fall of lakes in the Jianghan Plain', *Areal Research and Development*, 4 (1992), pp. 52-56.)

Constructing embankments for land reclamation

Although the lacustrine transformation of the Yunmengze, and the stabilization of the Jingjiang Riverbed have created favourable conditions for regional development, the prevalence of marshlands in the early stages made it challenging for humans to establish

permanent settlements. As a result, prior to the Tang Dynasty the population in this region did not experience significant growth. Following the 'An Lushan Rebellion' (安史之乱), persistent warfare in the Central Plains led many people to migrate southward to the Jianghan region for refuge and to safeguard their homes. *The Taiping Huanyu Ji (《太平寰宇记》)* records that:

> After the Dezhi period of the Tang Dynasty,[259] there were numerous individuals who moved about as labourers and relied on unstable means for their sustenance, resulting in a diverse mixture of people residing together. The local customs underwent substantial changes. Surrounding the city of Jiangling, [260] there were approximately three hundred thousand households. [261]

Although there was some population growth in the Jianghan Plain, the area had long been covered by lakes, and during the early stages of the decomposition of the Yunmengze lake cluster, the entire Jianghan Plain region remained sparsely populated, characterized by abundant farmland but a shortage of farmers. This demographic scarcity is particularly evident in ancient poetry and travel writings, which describe areas within the Jianghan Plain, such as Jianli, Mianyang, [262] and the lake regions of Wuhan, as marshy and overgrown with reeds, where tigers and wolves frequently roamed, indicating that these waterlogged areas were still largely undeveloped.[263] The increasing population created a demand for cultivated land; however, the relatively low population density posed significant challenges for agricultural development in the

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[259] The Dezhi period of the Tang Dynasty corresponds to the first regnal title of Emperor Li Heng. This era lasted a total of three years, spanning from July 756 to February 758.

[260] Jiangling City refers to the ancient city of Jingzhou, located in present-day Jingzhou, Hubei Province. is situated in the middle reaches of the Yangtze River, in the western part of the Jianghan Plain.

[261] 乐史（宋），*《太平寰宇记》*/ Shi Le (Song) Dynasty, *The Taiping Huanyu Ji.*

[262] Mianyang encompasses the present-day cities of Honghu and Xiantao, situated in the heart of the Jianghan Plain.

[263] 胡贝贝，<人地关系视角下江汉平原乡村景观形态特征研究-以荆州为例>，（硕士论文：华中科技大学，2023）. / Beibei Hu, Study on Rural Landscape Morphology Characteristics in Jianghan Plain from the Perspective of Man-Land Relationship: A Case Study of Jingzhou, (Master Thesis: Huazhong University of Science and Technology, 2023).

region. Consequently, much of the agricultural development in the Jianghan Plain during this period relied on collective actions undertaken by the government, such as embankment construction and land reclamation initiatives, to facilitate these efforts.

The Jianghan Plain is an alluvial plain formed by the combined effects of the Yangtze River and the Han River. The substantial sediment carried by these rivers causes an elevation in water levels due to sediment deposition, compelling residents—particularly those living near the banks of the Yangtze and Han Rivers—to construct levees for the protection of their settlements against flooding. This construction of hydraulic infrastructure facilitates the creation of extensive arable land that remains largely unaffected by floodwaters and is enriched with fertile soil.

Historical records from Volume 89 of the ancient text, *Collected Statutes of the Tang Dynasty (Tang Yao Hui) (《唐会要》)*, reveal that during the Tang Dynasty, the necessity for land reclamation led to the emergence of numerous farmlands requiring levee protection in the middle reaches of the Yangtze River.[264] This demonstrates that by the Tang Dynasty, a relationship had already been established between farmland and embankments, highlighting the existence of agricultural lands safeguarded by embankments.

In the *Commentary on the Waterways (《水经注》)*, there are textual records that document:

> On the right bank of the Yangtze River, extending from the northern area of Ezhou to Wuchang, the various agricultural fields under the jurisdiction of the

[264] 苏冕、杨绍、王溥（唐），*《唐会要（89 卷）》* / Mian Su, Shao Yang, and Pu Wang (Tang Dynasty), *Collected Statutes of the Tang Dynasty （Tang Yao Hui） (Volume 89).*

officially established department responsible for construction and engineering are interconnected and distributed along the Yangtze River.[265]

During the Southern Song Dynasty, the development of embankments was stimulated by large-scale military farming initiatives and the influx of immigrants from other regions into the Jianghan Plain.[266] Evidently, the construction of farmland organized by official entities along the banks of the Yangtze River was flourishing and widespread. This geographical arrangement, closely linked to the river, reflects the region's significant role in agricultural production, military strategy, and economic development during that period. In the Song Dynasty, Gong Meng (孟珙) [267] initiated a large-scale farmland construction project while overseeing defence operations in Jiangling. This initiative led to the construction of numerous embankments, marking the largest farmland development in the Jianghan Plain region along the river. This project significantly influenced the subsequent large-scale development of levee agriculture in the Jianghan Plain during the Ming and Qing dynasties, the prevalence of paddy fields in this region occurred during the Ming and Qing dynasties.

The warm and fertile Yangtze River floodplains were also areas of interest for development during that period. Relevant textual records regarding this can be found in the *Commentary on the Waterways (《水经注》)*:

On the riverbanks, the fertile fields are cultivated with various crops and are adorned with an abundance of sweet and delicious fruits. These picturesque

[265] 郦道元（南北朝），*《水经注》* / Yuandao Li (Northern and Southern Dynasty), *Commentary on the Waterways.*

[266] 湖北省水利志编撰委员会，*《湖北水利志》*，（北京：中国水利水电出版社，2000），页 349 / Compilation Committee of Water Conservancy Annals of Hubei Province, *Water Conservancy Annals of Hubei Province,* (Beijing: China Water & Power Press, 2005), p. 349.

[267] During his tenure as the governor of Jiangling, Gong Meng implemented a series of initiatives that had a positive and profound impact on the military, economic, and cultural aspects of the region. His efforts significantly contributed to the stability and development of Jiangling during the Southern Song period.

scenes reflect harmoniously with the river waters, closely nestled alongside the numerous islets within the river.

Zhang has noted in the literature that the 'beach polder' that emerged during the Qing Dynasty represents a gradual transformation of the original simple levees, which increased in height and width to become the later dyke structures. This observation corroborates that, prior to the Yuan Dynasty, there were indeed large-scale developmental activities on the tidal flats; however, such developments lacked effective protection and were limited to basic embankments.[268] Nevertheless, the allure of the riverbanks near the Yangtze River and the Han River at that time remains clear.

Water conservancy embankments

The Jingjiang Levees are a crucial component of the flood control system of the Yangtze River (Figure 132). Its construction and maintenance were vital for ensuring flood safety in the Jianghan Plain and the broader Yangtze River basin. The initial construction history of this structure dates to the Eastern Jin period. Over the course of various historical dynasties, workers undertook continuous repairs and reinforcements, gradually leading to the formation of its present scale.

[268] 张国雄，<江汉平原垸田的特征及其在明清时期的发展演变>，*《农业考古》*，1（1989），页 227-233 / Guoxiong Zhang, 'Characteristics of the Jianghan Plain's low-lying fields and their development during the Ming and Qing dynasties', *Agricultural Archaeology*, 1 (1989), pp. 227-233.

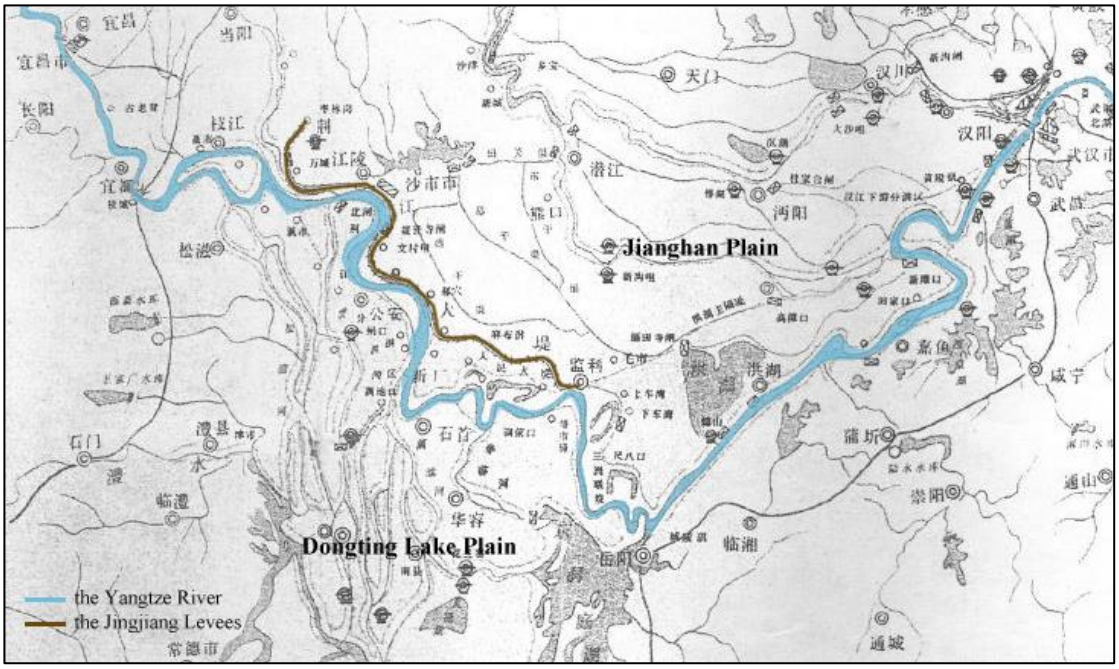


Figure 132. Topographic Map of the Jingjiang Levees (Source: recreated by the author, based on the 荆州市长江河道管理局，*《荆江提防志》*，（北京：中国水利水电出版社，2012）/ Jingzhou Yangtze River Administration Bureau, *Annals of Jingjiang Levees,* (Beijing: China Water & Power Press, 2012))

During the Qin and Han dynasties, the sediment carried by the Yangtze River accumulated over an extended period in the Yunmengze region, gradually forming shoals and eventually giving rise to the Jingjiang Levees, with Jiangling as its starting point. After the establishment of the Jingjiang riverbed, increased water levels due to the confinement of the river flow led to the inadequacy of the low-lying embankments in protecting against flooding. By the Wei and Jin periods, the waters of the Yangtze River had encroached upon what is now the ancient city of Jingzhou, posing a direct threat to its safety. According to the *Commentary on the Waterways (《水经注》)*：

> The topography of Jiangling slopes toward the southeast, prompting the construction of the Jin Embankment (金堤) along this region. The construction began at Lingxi (灵溪) [269] under the supervision of Zun Chen (陈遵), as ordered by Wen Huan (桓温) during the Eastern Jin period.

[269] Lingxi is located in the Jingzhou District of Jingzhou City, Hubei Province, today.

This text presents the earliest record concerning the construction of the Jingjiang Levees. During the Wei and Jin dynasties, the present-day Jingzhou area experienced severe flooding, making it difficult for residents to live safely. To address the threat posed by these water disasters and to safeguard the wellbeing of both the populace and the urban environment, Wen Huan, the governor of Jingzhou during the Eastern Jin period, appointed Zun Chen to oversee the construction of the Jin Embankment.

During the Northern Song Dynasty, the prefect of Jingzhou constructed the Shashi Embankment (沙市堤). In the Southern Song Dynasty, the Huangtan Embankment (黄潭堤) was built, and the Jindi was also reinforced. Through the expansion and maintenance efforts over the two Song Dynasties, the Jingjiang Levees began to take shape. Subsequently, the Jindi underwent continuous expansion and repairs, eventually evolving into the present-day Jingjiang Levees.

Amidst the intense human-environment conflicts, the construction of hydraulic embankments in the heart of the Jianghan Plain was fundamentally supported by the interconnected Jingjiang Levees, alongside the ample labour force brought about by a rapidly growing population. During this historical phase, the Jianghan Plain underwent continuous agricultural land development activities. Following the Yuan dynasty, the ongoing construction of dykes in the Jianghan Plain facilitated extensive water management improvements across much of the region. Initially to cultivate farmland, farmers would typically construct embankments along the banks of rivers to ensure the safety of their fields. During the Southern Song dynasty, the government recognized the legitimacy of private initiatives for reclaiming lakeside land and issued edicts encouraging the public to develop ‘wastelands along the river.’ This led to the emergence of significant agricultural water management activities associated with the construction of embankments along the riverbanks. Such widespread hydraulic infrastructure development laid the groundwork for the formation and evolution of the

polder field agricultural landscape during the Ming and Qing dynasties. By the Ming dynasty, the Jianghan Plain, characterized by light taxation on open land, became highly attractive to labourers, resulting in rapid growth of polder field agriculture, with numerous embankments constructed across various regions—an issue that will be explored in the next chapter.

Ecological Adaptation Processes of Settlements

Before the Tang Dynasty

Between the Qin and Tang dynasties, the settlement distribution in the Jianghan Plain was generally sparse and characterized by its small scale. This is evidenced by the observation in the *Book of Han: Treatise on Geography (《汉书. 地理志》)*, which states:

> The land of Chu and Yue is vast and sparsely populated.[270]

During this historical period, the area experienced minimal development. However, in the work *Journey into Shu (《入蜀记》)* by the Southern Song poet Lu, the habitation phenomena in the plains, such as in the region of Baili Zhou (present-day Zhijiang, Hubei), [271] are described as 'houses facing each other.' [272] This indicates that, at least from the Han to the Song dynasties, there was some degree of development in the scale and quantity of settlements in the Jianghan Plain. Nevertheless, by the Yuan dynasty, frequent warfare and natural disasters led to a significant decline in the permanent population of the Jianghan Plain. Most areas within the region once again experienced a low population density and desolation of land, resulting in a vast territory with few

[270] 班固（汉），*《汉书.地理志》* / Gu Ban (Han Dynasty), *Book of Han: Treatise on Geography*

[271] Baili Zhou: Now in Zhijiang, Hubei

[272] 陆游（宋），*《入蜀记》* / You Lu (Song Dynasty), *Journey into Shu*

inhabitants. [273]

In the preface of the *Yingshan County Chronicle (《应山县志》)*, it is recorded:

> In the past, during the wars at the end of the Yuan dynasty, this area served as a battlefield. The ravages of soldiers and horses have transformed it into a wasteland of warfare, obliterating any traces of cultivated fields.[274]

This statement serves as evidence of the detrimental effects that war has had on the Jianghan Plain region.

Due to the impact of warfare, many historical records and documents were lost, necessitating the reliance on extant poetry and literature from ancient authors to uncover evidence of settlement landscapes during this period.

From early times, the inhabitants of the Jianghan Plain developed a fishing industry. The *Book of Han 《汉书》* records that

> The people of Jing and Yang generally rely on the mountains and marshes, engaging in fishing and gathering as their livelihood.

Those who depended on fishing likely resided in proximity to water sources. *The Collection of Meixi (《梅溪后集》)* depicts the landscape of the Jianghan Plain during that period, stating that 'fishermen's livelihoods occupy the sandbars', and 'the smoke from fisherfolk's homes rises along the shores,' while passers-by frequently encountered a scenery characterized by 'faint smoke and rain, with fishermen's dwellings on both

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[273] 鲁西奇,*《区域历史地理研究：对象与方法-汉水流域的个案考察》*,(北京：社会科学文献出版社，2019)，页 323-327 / Xiqi lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Vally*, (Beijing: Social Science Academic Press (China), pp. 323-327.

[274] *《应山县志》/ Yingshan County Chronicle*

banks.' [275]

Tang Dynasty poet Jian Wang (王建) referenced in his poem *On the Road to Jiangling* *(《江陵道中》)* describes the scene of the Jianghan Plain in that Period:

> In the water villages situated along the river, whenever the water level recedes and unveils the flat terrain, fishermen engage in their activities, diligently catching fish in the river. Their small boats navigate through the aquatic vegetation with purpose. [276]

The term 'water villages' likely refers to settlements located along waterways. As previously mentioned, the Jianghan Plain experienced frequent flooding in earlier times, necessitating the discussion of a unique form of habitation—water-based dwellings. Some communities utilized boats as their living spaces, and these populations were distributed throughout the interior of the Jianghan Plain. These boat-dwelling communities formed settlements, which possess a remarkably ancient history that may trace back to the Qin and Han Dynasties, and persisted into the Ming Dynasty, albeit in reduced numbers.[277] Clearly, this transformation occurred over an extended period, closely linked to the gradual development of the Jianghan Plain and the increasing capacity of its inhabitants to adapt to and manage flooding.

Based on the preceding analysis of the poetry from the Jianghan Plain during the Tang and Song dynasties, as well as the region's flat topography, extensive river networks, and numerous lakes, it is evident that this unique geographical environment provided the foundational conditions for the development of water-based and boat-dwelling

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[275] 王十朋（宋），*《梅溪后集》* / Shipeng Wang (Song Dynasty), *The Collection of Meixi*

[276] 王建（唐），*《江陵道中》* / Jian Wang (Tang Dynasty), *On the Road to Jiangling.*

[277] 荣蓉，<江汉平原南部居民与聚落研究>，（硕士论文：华中科技大学，2010）. / Rong Rong, Study of Residents and Settlements in Southern Jianghan Plain, (Master Thesis: Huazhong University of Science and Technology, 2010).

lifestyles. This section of the article categorizes the settlement types in the Jianghan Plain from the Qin to the Yuan dynasties into two distinct models, reflecting the living conditions of the residents at that time: 1. migratory water-based settlements; 2. migratory bird-like settlements.

The term 'migratory water-based settlements' primarily refers to communities comprised of boats, rafts, and similar watercraft, constituting transient settlements that drift upon the water's surface. Typically, a single boat functions as a household, with generations of boat dwellers residing on board and primarily relying on cargo transportation and fishing for their livelihoods. In such settlements, the spatial relationships among structures are relatively loose, as they are composed of boats where residents both work and live. Each boat serves as a household unit, with families engaging in separate activities during the day and reconvening in the evening to rest, thereby forming distinct settlements. Due to the unpredictable movement of these boats, the overall shape of such settlements remains variable.

Historical records of water-based settlements date back to the Wei, Jin, and Northern and Southern Dynasties, as evidenced by the text *Song of Shicheng (《石城乐》)*, which mentions 'the large vessel has the capacity to carry three thousand', and 'the aspiration is to reside in a lasting partnership with a beloved individual',[278] indicating that by that time, water-based settlements had attained a particular scale. *The Collected Works of Mianzhai (《勉斋集》)* from the Song Dynasty notes that there were 'four hundred boats' in use, while the total number of households within the city was only 'over a thousand,' [279] highlighting the significant proportion of floating settlements during that period.

[278] *《石城乐》/ Song of Shicheng.*

[279] 黄干（宋），*《勉斋集》*/ Gan Huang (Song Dynasty), *The Collected Works of Mianzhai.*

During the Ming Dynasty, there was a significant reduction in historical records concerning water-dwelling settlements. In the poem *Jingling Shushi (《竟陵书事》)*, the water-dwelling communities in the Jianghan Plain are described as 'the water country where boats serve as markets.' [280] This indicates that the function of these water dwellings had shifted from that of a settlement to that of a marketplace. By the Guangxu period of the Qing Dynasty (1871-1908), textual references in the *Jingzhou Prefecture Gazetteer (《荆州府志》)* noted that 'many of the individuals residing near the banks of the Yangtze River are engaged in fishing activities.' [281] At this point, the scale of households had significantly diminished compared to earlier historical periods; the migratory nature of water-dwelling settlements was no longer the predominant form of habitation. Consequently, during the Ming and Qing Dynasties, this lifestyle was no longer sufficient to create a distinct settlement landscape.

Migratory bird-like settlements are primarily distributed in areas of the Jianghan Plain that are in proximity to water resources. A defining characteristic of these settlements is that residents choose to reside either on land or on waterborne vessels depending on seasonal changes. This phenomenon arises from the cyclical variation in the extent of land and water across different seasons, resulting in a systematic relocation of the settlements. Such settlements do not have fixed terrestrial residences and exist in a state of flux. *The Unified Annals of the Great Ming Dynasty (《大明统一志》)* provides a clear description of this settlement pattern in the Jianghan Plain:

> During the spring flooding, farmers migrate to the plains and low-lying areas for cultivation; when the rivers dry up in autumn and winter, they relocate back to areas near lakes, relying on fishing to sustain their livelihoods.[282]

Residents who have migrated here due to war may stay temporarily, but as their duration

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[280] 何乔新（明），*《景陵书事》* / Qiaoxin He (Ming Dynasty), *Jingling Shushi.*

[281] *《荆州府志.地理志.风俗》* / *Customs in Geography Records of Jingzhou Prefecture Gazetteer.*

[282] 李贤，彭时（明），*《大明统一志》* / Xian Li, Shi Peng (Ming Dynasty), *The Unified Annals of the Great Ming Dynasty.*

of residence increases, they may choose to settle permanently, gradually evolving into genuine immigrants, leading to the disappearance of these temporary settlements. So under these circumstances, migratory settlements exhibit cyclical characteristics and demonstrate patterns of rise and decline over time.

From the Tang Dynasty to the Yuan Dynasty

Beginning in the Tang Dynasty, the ongoing activities of levee construction and land reclamation led to the emergence of settlement landscapes along the riverside during this historical period. Through an analysis of relevant ancient poetry and prose, this chapter identifies two primary types of settlement landscapes characterized by their proximity to the river: (1) landscape pattern of riverbank settlements; and (2) landscape pattern of settlements surrounding levees (Figure 133).



Figure 133. Two Patterns of Settlement Landscapes (Source: recreated by the author, based on Google Earth)

The first type of settlement landscape predominated, as the majority of farmers in the Jianghan Plain opted to inhabit and cultivate land on the riverbanks. For instance, *The Taiping Huanyu Ji (《太平寰宇记》)* documents that:

> During the Tang and Song dynasties, the inhabitants of the Jingzhou area predominantly resided on the numerous small river islands along the Yangtze River.[283]

This statement indicates that residents living near Jingzhou tended to establish their settlements close to the Yangtze River. At that time, the river and its tributaries created numerous large and small river islands due to the dynamics of water flow and topography. These islands, characterized by relatively flat terrain and proximity to water sources, facilitated activities such as water collection, fishing, and transportation, gradually transforming into areas of habitation. This development reflects the actual living conditions of the residents in the Jianghan Plain during that historical epoch.

The settlement pattern surrounding the levees primarily describes the landscape of urban towns. For instance, in Wang's poem *Things at Jiangling (《江陵即事》)*, the poet depicts Jiangling with the lines:

> The observation towers of the ferry terminal, extending over a distance of ten miles, rise majestically, seemingly imposing upon the levee below.[284]

This ancient verse illustrates the grandeur and magnificence of the architecture in the Jiangling region, as well as the spatial relationship between the ferry tower and the embankment. Additionally, it indirectly reflects that Jiangling was likely a bustling transportation hub with thriving commercial activities during that period.

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[283] 乐史（宋），*《太平寰宇记》* / Shi Le (Song Dynasty), *The Taiping Huanyu Ji.*

[284] 王建（唐），*《江陵即事》* / Jian Wang (Tang Dynasty), *Things at Jiangling.*

Lu stated in *the Journey into Shu (《入蜀记》)*:

> Looking back towards the river embankment of Hanyang, one observes a series of stacked pavilions illuminated by bright lights, accompanied by the sounds of singing and calls echoing in the air.[285]

This statement depicts the bustling and vibrant atmosphere of the Hanyang embankment area, characterized by numerous buildings and a lively ambiance during the night, illustrating the urban landscape and lifestyle of the time and place.

In contrast to the flourishing scenes of riverside settlements, the period between the Tang and Yuan dynasties did not witness significant development in the central regions of the Jianghan Plain, which remained largely uninhabited. In 1170, Lu, upon entering the Jianghan Plain from present-day Wuhan, noted in his work *the Journey into Shu (《入蜀记》)* that 'the banks of the Yangtze River are covered with endless stretches of reeds, and this place is referred to as 'Bai Li Huang (百里荒)'.' [286] Similarly, in 1177, Fan remarked in the *Records of a Trip on a Wu Boat (《吴船录》)* that 'the area known as 'Bai Li Huang (百里荒)' is filled with lakes and dense reeds, with scarcely any signs of human habitation; it is a frequent haunt for large bandits.' [287]

Official population statistics from various dynasties also support the assertion that substantial development had not occurred in the interior of the Jianghan Plain during this time, indicating a persistent lack of human activity, particularly in the wetland

[285] 陆游（宋），*《入蜀记》*/ You Lu (Song Dynasty), *Journey into Shu.*

[286] 陆游（宋），*《入蜀记》*/ You Lu (Song Dynasty), *Journey into Shu.*

[287] 范大成（宋），*《吴船录》*/ Dacheng Fan (Song Dynasty), *Records of a Trip on a Wu Boat.*

regions. [288] Even when settlements did exist, they were relatively sparse prior to the Ming Dynasty. In contrast, the settlements that emerged along the river during the Tang and Song Dynasties represent a historically significant cultural landscape within the temporal scope of this chapter.

The Emergence of Buddhist Landscapes

From a macro-historical perspective, the introduction of Buddhism to the Jianghan Plain can be traced back to the Eastern Han Dynasty. [289] This early arrival facilitated the gradual development of the religious landscape in the Jianghan Plain region from the Qin Dynasty to the Yuan Dynasty. During the Qin and Han Dynasties, this landscape was in its nascent stage, primarily characterized by folk shamanism and ancestor worship. Following the introduction of Buddhism in the Han Dynasty, rudimentary religious structures began to emerge.

According to the ancient inscriptions on the 'Ancient Stele of Lingshan Mountain' (古灵山碑), it is documented that 'Ling Shan Temple was established at Gaoguan Mountain during the reign of Emperor Ming of Han', which provides some evidence to support this assertion. In this context, Gaoguan Mountain refers to She Mountain, located on the eastern bank of the Yangtze River in Wuhan. Unfortunately, Ling Shan Temple no longer exists, and the inscription has long since been lost.

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[288] 鲁西奇,《区域历史地理研究-对象与方法：汉水流域的个案考察》,（北京：社会科学文献出版社，2019），页 301-332 / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), pp. 301-332.

[289] 张正明，刘玉堂，*《湖北通史.魏晋南北朝卷》*,（武汉：华中师范大学出版社，1999），页 481-482 / Zhengming Zhang, Yutang Liu, *General History of Hubei. Wei, Jin, Southern, and Northern Dynasties Volume,* (Wuhan: Central China Normal University Press, 1999), pp. 481-482.

The architectural form of pagodas in China was also introduced with the introduction of Buddhism. The emergence of ancient pagodas in China can be traced back to the Eastern Han Dynasty. Although historical records document the existence of several pagodas in the Jianghan Plain after the Eastern Han period, many of these structures have not survived to the present day due to factors such as warfare. Current archaeological excavations indicate that the earliest pagodas discovered in the Jianghan Plain date back to the Tang Dynasty. [290]

During the Wei, Jin, and Northern and Southern Dynasties, societal upheaval catalysed rapid religious development, leading to an increase in the number of temple constructions as Buddhism gradually spread throughout the Central Plains region. At this time, Buddhist temples began to emerge in the Jianghan Plain, incorporating architectural styles from both the Central Plains and Jiangnan regions. According to the textual records found in Volume 3 of the *Debate on Correctness (《辩证论》)*, and Volume 120 of the *Anthology of the Dharma Garden (《法苑朱琳》)*, during the Liang Dynasty there were approximately 2,846 temples and around 82,700 monks and nuns in China. [291] [292] Many of these temples were located in the Jianghan Plain, with several constructed in Jiangling during the Liang period, including Yaoguang Temple, Puxian Nunnery, Waguang Temple, Tianju Temple, Tiangong Temple and Shouwang Temple. Although these establishments were relatively small in scale, they laid a foundation for the integration of Buddhism into the local community. The architectural style of these early temples was likely quite simple, primarily designed to meet the basic needs of religious activities.

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[290] 中国国家文物局主编，*《中国文物地图集（湖北分册）》*，（西安：西安地图出版社，2002），页 66-67. / Edited by the National Cultural Heritage Administration of China, *Cultural Relics Atlas of China (Hubei Volume)*, (Xi'an: Xi'an Map Press, 2002), pp. 66-67.

[291] 法琳（唐），*《辩证论（第三卷）》*/ Lin Fa (Tang Dynasty), *Debate on Correctness (Volume 3).*

[292] 释道世（唐），*《法苑朱琳（第一百二十卷）》*/ Daoshi Shi (Tang Dynasty), *Anthology of the Dharma Garden (Volume 120).*

During the Tang Dynasty, religion flourished, and numerous renowned temples emerged as vital centres for cultural exchange and artistic creation. This period witnessed a significant increase in the number and scale of Buddhist temples across the Jianghan Plain.[293] Many large-scale Buddhist temples were constructed, and their architectural styles became increasingly diverse, incorporating characteristics from both the Central Plains and southern regions. Notable temples were established or expanded during this time; for instance, the West Pagoda Temple in Tianmen evolved into a major Zen monastery. Typically, large temples are often composed of contiguous architectural complexes that encompass four functional areas: halls, living quarters, guest rooms, and gardens.[294] The layout of these temples became more structured, leading to the gradual establishment of a symmetrical architectural pattern along the central axis, which included essential buildings such as the mountain gate, the Hall of Heavenly Kings, the Great Buddha's Hall, and the scripture repository (Figure 134). At



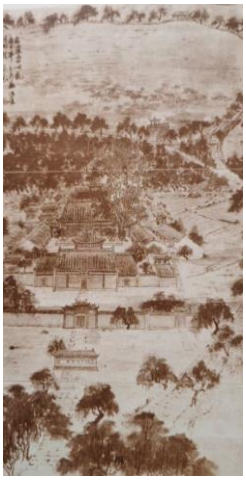


Figure 134. Aerial Drone Photography of Zhanghua Temple and *The Old Appearance of Zhangtai in Ancient Times* . (Source: Aerial Drone Photography was captured by the author, and *The Old Appearance of Zhangtai in Ancient Times* from 湖北省沙市市地名委员会，*《沙市市地名志》*，（武汉：湖北人民出版社，1984）/ Place Name Committee of Shashi City, Hubei Province, *Ancient Zhangtai's Former Appearance,* (Wuhan: Hubei People's Publishing House Press, 1984))

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[293] 张正明，刘玉堂，*《湖北通史.隋唐五代卷》*，（武汉：华中师范大学出版社，1999），页 52-56 / Zhengming Zhang, Yutang Liu, *General History of Hubei. Sui, Tang and Five Dynasties Periods Volume,* (Wuhan: Central China Normal University Press, 1999), pp. 52-56.

[294] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 240. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 240.

this time, the decoration of religious architecture became increasingly exquisite, with folk artistic forms such as sculpture and painting being widely incorporated into temple structures.

The image on the left in Figure 134 is a drone aerial photograph of the current state of Zhanghua Temple, clearly illustrating the layout features of the temple's landscape. The existing Zhanghua Temple developed on the basis of a reconstruction during the Qing Dynasty (1644-1911). By comparing it with the painting titled *Ancient Zhangtai's Former Appearance* shown on the right of Figure 134, one can intuitively discern the continuity and evolution of the temple's landscape layout and architectural form. According to inscriptions within the temple, Zhanghua Temple was originally established during the Taiding period (泰定年间) (1324-1328) of the Yuan Dynasty. While current historical records do not fully restore the temple's original appearance, an analysis of the Qing Dynasty-era temple landscape combined with general characteristics of Chinese Buddhist temple layouts and architecture provides significant insights. These insights are essential for speculating about the fundamental features of Buddhist temple landscapes in the Jianghan Plain.

The architectural style of ancient pagodas reached its zenith during the Tang Dynasty. During this period, the height and scale of pagodas continuously increased, characterized by more elegant designs and refined craftsmanship. For instance, the Iron Pagoda at the Yuquan Temple in Dangyang[295] is an octagonal structure comprising thirteen tiers (Figure 135).



Figure 135. The Iron Pagoda at Yuquan Temple. (Source: captured by the author)

[295] Danyang is situated at the western edge of the Jianghan Plain.

This situation persisted until the Five Dynasties period, during which the policies of Emperor Rong Chai (柴荣) led to the suppression of Buddhism and the subsequent loss of many Buddhist texts, resulting in a gradual decline of the religion. By the Song Dynasty, societal attitudes toward Buddhism became more moderate and rational, resulting in support for the reconstruction and restoration of temples damaged by warfare.[296] Several temples that had suffered during the turmoil at the end of the Tang Dynasty and throughout the Five Dynasties were rebuilt, and improvements may have been made upon their original structures. After the establishment of the Yuan Dynasty, Tibetan Buddhism was introduced to the Central Plains, integrating with indigenous forms of Buddhism to create a new Buddhist culture that attained a status nearly equivalent to that of a state religion. Nevertheless, the condition of temples continued to reflect characteristics from the Song Dynasty, suggesting that there were no significant changes in architectural style or layout during this period. Minor influences from Yuan cultural and artistic styles may have been evident in certain details, such as architectural decorations incorporating elements from other ethnic artistic traditions.[297]

During the Song and Yuan dynasties, a trend of fusion between Buddhism and Daoism began to emerge.[298] Temples became increasingly focused on practicality and functionality, integrating harmoniously with their surrounding landscapes.[299] Ancient pagodas emphasized artistic and decorative qualities, with some incorporating viewing platforms for individuals to ascend and enjoy distant vistas. The religious landscapes

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[296] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 325-326. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), pp. 325-326.

[297] 张正明，刘玉堂，*《湖北通史.宋元卷》*，（武汉：华中师范大学出版社，1999），页 400-406 / Zhengming Zhang, Yutang Liu, *General History of Hubei. Sui, Song and Yuan Dynasties Volume,* (Wuhan: Central China Normal University Press, 1999), pp. 400-406.

[298] 张正明，刘玉堂，*《湖北通史.宋元卷》*，（武汉：华中师范大学出版社，1999），页 392 / Zhengming Zhang, Yutang Liu, *General History of Hubei. Sui, Song and Yuan Dynasties Volume,* (Wuhan: Central China Normal University Press, 1999), p. 392.

[299] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 327. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), p. 327.

from this historical period serve as a testament to the rise and fall of religion in the Jianghan Plain and its subsequent amalgamation, reflecting the societal, economic, and cultural conditions of the time and holding significant value.

Temple landscape

The dissemination and promotion of Buddhist culture in the Jianghan Plain have led to the emergence of numerous ancient temples in this region. Notable surviving temples include Xita Temple in Tianmen, Pufou Temple in Xiantao, Qingning Temple in Qianjiang, Dongguan Temple in Jingzhou, Tang'an Ancient Temple in Jingmen, Zhanghua Temple in Jingzhou, and Baotong Temple in Wuhan, among others.

During the Tang Dynasty, the architectural system of temples had become well-established. Many large temples often consisted of extensive clusters of interconnected buildings. In the construction of temple gardens, there was a significant emphasis on landscaping, with particular attention paid to the cultivation of trees and flowers, which gained widespread recognition.[300] While maintaining a solemn atmosphere conducive to religious practices, the temple landscapes also adapted to secular tastes, thereby integrating elements of earthly pleasure into their design.

Xita Temple

[300] 周维权，*《中国古典园林史》（第三版）*，（北京：清华大学出版社，2008），页 240-241. / Weiquan Zhou, *History of Classical Chinese Gardens (Third Edition),* (Beijing: Tsinghua University Press, 2008), pp. 240-241.

Located in Tianmen City, Xita Temple is one of the representative ancient Buddhist temples on the Jianghan Plain from this historical period (Figure 136). According to the records in *The Origins Record of Xita Temple (《西塔寺源流》)*, [301] the temple was initially established during the Eastern Han Dynasty, over 1,700 years ago, as a simple thatched hut. Over time, it underwent various transformations. The arrival of the eminent monk during the Jin Dynasty enriched its cultural and religious significance. In the Tang Dynasty, the temple gained significant renown when Yu Lu (陆羽) [302] was adopted and grew up there, contributing to its reputation through his writings and scholarship, leading to considerable construction activities at the temple.



Figure 136. Photograph of the main entrance of the Xita Temple in contemporary times. (Source: captured by the author)



Figure 137. The landscape of the Xita Temple and the Jingling West Lake. (Source: captured by the author)

Throughout the Yuan, Ming, and Qing Dynasties, the temple faced both destruction and restoration. The current layout of Xita Temple is influenced by the design of the four renowned temples, with its architecture and landscapes characterized by dignity and grandeur. The temple complex includes the main hall, a scripture repository, gardens, and a stelae forest, all set against a backdrop of beautiful natural scenery (Figure 137).

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[301] *The Origins Records of Xita Temple* is a historical document that chronicles the evolution of Xita Temple in Tianmen City. It meticulously details the development of the temple from its origins as a thatched hut during the Eastern Han Dynasty, through various historical periods, including the Jin, Tang, Yuan, Ming, and Qing Dynasties. The text encompasses the temple's origins and its fluctuations in prosperity and decline throughout different eras.

[302] Yu Lu (733–c. 804), a native of Jingling in the Tang Dynasty (present-day Tianmen, Hubei), was a prominent tea scholar and a foundational figure in the development of tea culture during this period.

The natural scenery surrounding Xita Temple is exquisite, characterized by undulating mountains in the distance and the West Lake close by. The lake features lotus leaves and flowers, while koi fish swim within its waters. Reeds encircle the temple along the lakeside, enhancing the tranquil atmosphere.

Xita Temple houses an important relic, the ancient Wen Xue Well (文学井), which is believed to have been established during the Jin Dynasty (Figure 138). This well, known as the Ancient Lu Yu Well (陆羽井), gained its designation due to its association with Yu Lu, who reportedly sourced water from it for tea preparation and tasting.[303] Historical records from the Qing Dynasty, specifically the *Tianmen County Annals*, indicate that the earliest documented use of this spring for tea brewing occurred over 1,600 years ago, attributed to a prominent monk of the Jin Dynasty.[304] It is also said to be the site where Lu collected water and brewed tea during his youth. The well gained attention at that time for its superior water quality, making it a preferred choice for tea brewing. According to this account, the well may have existed as early as the Jin Dynasty, though it may not have been called the Ancient Lu Yu Well at that time.



Figure 138. Photograph of the Wen Xue Well (Lu Yu Well) Ruins. (Source: captured by the author)

Baotong Temple

Baotong Temple, located in Wuhan, is the largest existing temple in the city in terms of

[303] Yuxiang Chen, 'Reflecting on the past while savouring tea by the Wen Xue Well', *Tianmen Website*, 3 (2022), < https://www.tmwcn.com/html/life/286/202203/t255546.html > [accessed 11 August 2023].

[304] 王希琮（清），*《天门县志》* / Xicong Wang (Qing Dynasty), *Tianmen County Annals.*

land area.[305] It was originally established during the Liu Song period of the Southern Dynasties (420–479 AD) and was initially named Dongshan Temple, making it one of the oldest temples in Wuhan, with a history spanning over 1,600 years. Following several renamings and reconstructions, it was ultimately renamed Baotong Temple in the twenty-first year of the Chenghua era of the Ming Dynasty (1485 AD), a name that has persisted to the present day. [306]

Throughout its history, Baotong Temple has undergone numerous periods of destruction and reconstruction due to warfare. Between the fifteenth and thirtieth years of the Kangxi reign of the Qing Dynasty (1676–1691 AD), the Qing government allocated funds on multiple occasions for the repair and expansion of Baotong Temple. The temple was renowned at that time as the foremost Buddhist temple in Wuhan. The existing temple gardens and the buildings within them were primarily constructed between the fourth year of the Tongzhi reign (1865 AD) and the fifth year of the Guangxu reign (1879 AD). [307]

Baotong Temple is a royal temple, characterized by an architectural style that bears similarities to the Forbidden City in Beijing. Generally, the scale and style of buildings in ordinary temple gardens are not as grand and meticulously designed. In contrast, the halls of Baotong Temple exude an impressive grandeur, featuring a rigorous layout and decorations, which reflect a high standard and rank, clearly showcasing royal attributes. According to the *Hongshan Baotong Temple Gazetteer (《洪山宝通寺志》)*, during the Kangxi era of the Qing Dynasty (1662-1722 AD), there was a green glazed dragon at

[305] 骆帆，<宝通寺研究：传承、演变与影响>，（武汉：中南民族大学，2016）/ Fan Luo, 'Research on Baotong Temple: Heritage, Evolution, and Influence', (Wuhan: South Central Minzu University).

[306] Baotong Temple, 'The Historical Evolution of the Name - Baotong Temple', *Baotong Temple*, 3 (2017) < https://www.baotongsi.com/bencandy.php?fid=86&id=4224> [accessed 19 March 2023].

[307] Wuhan Local Chronicles Compilation Committee, 'Baotong Temple', *Wuhan Chronicles: Social Volume*, 2017 < http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1111/category_id/434828.html > [accessed 20 March 2023].

the front of the temple, and a golden dragon coiled around the main pillars of the Buddha hall, depicted with vivid realism. Such opulent decoration is relatively rare in ordinary temples and aligns more closely with the characteristics of royal temples. [308]

The landscape within Baotong Temple is beautiful, as the temple is built against the mountains, creating an elegant environment with fresh air. Trees within the temple rise majestically, contributing to the lush greenery. Notably, the temple is home to extensive pine forests, some of which contain ancient trees personally planted by the national hero Fei Yue (岳飞) during the Southern Song Dynasty in the Shaoxing period (1131-1135 AD). There is a ginkgo tree over 150 years old; during the autumn and winter seasons, its leaves turn a brilliant golden yellow, contrasting with the temple's architecture and creating an visual tableau (Figure 139).



Figure 139. Photograph of the interior landscape of Baotong Temple. (Source: captured by the author)

The architectural style of Baotong Temple is distinctive, featuring an overall layout oriented from north to south. The temple buildings are situated in close proximity to the mountain, illustrating a harmonious coexistence with the natural environment. The entire temple complex rises and falls in accordance with the terrain, seamlessly integrating with the natural landscape and exhibiting a well-structured layering.[309] The structures within the temple primarily employ brick and wood construction, characterized by hip roofs with decorative eaves and intricately painted and carved elements (Figure 140). Among these temple buildings, the

[308] Baotong Temple, 'The present and past of Hongshan Baotong Temple, a royal monastery', *Baotong Temple*, 9 (2010), < https://www.baotongsi.com/bencandy.php?fid=86&id=4218> [accessed 19 March 2023].

[309] Baotong Temple, 'Introduction to Baotong Temple', *Baotong Temple*, 6 (2010), < https:// https://www.baotongsi.com/bencandy.php?fid=86&id=4210> [accessed 19 March 2023].

Hongshan Pagoda is positioned at the highest elevation within the complex, its height surpassing that of the other structures. Surrounded by towering trees, it serves as a prominent landmark and scenic feature (Figure 141).[310] The content related to the Hongshan Pagoda will be explored in detail in the following subsections of this chapter.

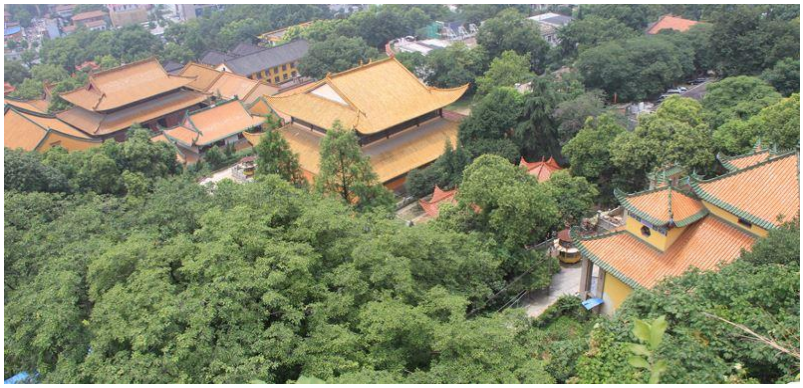


Figure 140. Aerial photograph of the roof of Baotong Temple. *(Source:* Baotong Temple, 'The scenery of the Baotong Temple', *Baotong Temple*, 5 (2017), <https://www.baotongsi.com/bencandy.php?fid=156&id=2901> [accessed 19 March 2023].

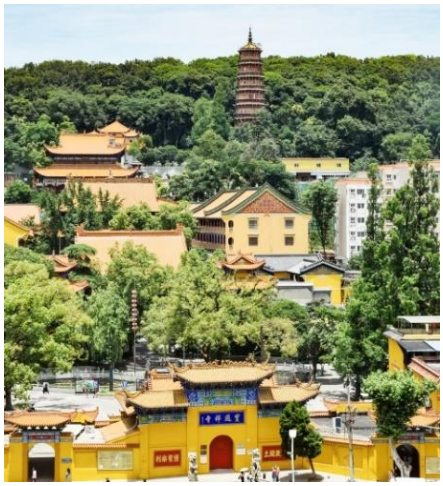


Figure 141. Photograph of the landscape features of Baotong Temple. (Source: captured by the author)

[310] 王正明，<武昌洪山宝塔>，《江汉考古》，2（1980），页 114 / Zhengming Wang, 'The Hongshan Pagoda, Wuchang', *Jianghan Archaeology*, 2 (1980), p. 114.

Zhanghua Temple

Zhanghua Temple is located in Shashi District of Jingzhou City and was initially established during the Yuan Dynasty, with renovations occurring in the Qing Dynasty. Originally named Zhangtai Temple, it was renamed Zhanghua Temple in the early Ming Dynasty.[311]



Figure 142. Aerial photograph of the layout of Zhanghua Temple. (Source: captured by the author)

The temple complex is oriented east to west and features a palace-style architectural layout characterized by its systematic and rational arrangement, as well as its grandiose structures and orderly halls. Upon entering the main gate of the temple, visitors will find a series of halls arranged from south to north, which include significant Buddhist edifices such as the Hall of Heavenly Kings, the Great Buddha's Hall, the Sutra Collection Pavilion, the Hall of Guanyin, and the Hall of Amitabha (Figure 142).

The temple is surrounded by lush greenery, creating a tranquil atmosphere. In addition to the architectural structures, the landscape elements within the Zhanghua Temple gardens include historical sites such as the ancient plum tree, an ancient ginkgo tree from the Tang Dynasty and an Agarwood Well.

The Agarwood Well is an ancient well located within Zhanghua Temple (Figure 143). Its bottom is paved with agarwood, and the well's water is fragrant and sweet, never having run dry. Baichuan Wang (王百川), a Qing Dynasty scholar, documented this

311 孙君恒，*《荆楚佛寺道观》*，（武汉：武汉出版社，2012），页 51 / Junheng Sun, *The Buddhist temple and Taoist monastery of Jingchu.*, (Wuhan: Wuhan Publishing House, 2012), p. 51.

well in his work *Chronicles of Shashi (《沙市志略》)*:

> The Agarwood Well is situated next to Zhanghua Temple. It is said to have been constructed by King Ling of Chu and is also known as the Flower Watering Well. Today, the remnants of this site have been buried, and the broken stone tablet lies under the setting sun, its inscriptions faded and difficult to discern. [312]

During the Kangxi period of the Qing Dynasty (1662-1722 AD), a tribute student named Mei Zong (宗湄) composed a five-character poem entitled *Agarwood Well. Five-character Verse (《沉香井. 五言》)*, which depicts the scene of palace maids drawing water from the well. The poem reflects on the uncertainties and hardships of the maids' lives while contrasting their experiences with those of the monks, thereby highlighting a serene and tranquil atmosphere as well as the disparities between different life circumstances.



Figure 143. Photograph of the Agarwood Well taken in the late 1980s. (Source: The Standing Committee of Jingzhou Municipal People's Congress, 'The Controversy Surrounding the Name of the Agarwood Well', *Jingzhou Daily*, 8 (2018), <http://www.jzrd.gov.cn/343/302.html> [accessed 11 March 2023].)



Figure 144. Photographs of Agarwood Wells and Ancient ginkgo tree from the Tang Dynasty. (Source: captured by the author)

[312] 王百川（清），*《沙市志略》* / Baichuan Wang (Qing Dynasty), *Chronicles of Shashi.*

During the period of the Republic of China (1912-1949 AD), monks continued to use water from the Agarwood Well for various daily activities, such as washing clothes, rinsing rice, brewing tea, and irrigating the vegetable garden. Life proceeded as it had before, as if nothing had changed. Today, the ancient Agarwood Well remains well-preserved within the Zhanghua Temple, still filled with water (Figure 144).

To the east of the Agarwood Well stands an ancient ginkgo tree from the Tang Dynasty, which has survived for over 1,400 years.[313] This ginkgo tree is markedly different from the typical specimens one encounters, being significantly more robust and weathered than those commonly found along the roadside. It reaches a height of approximately 27 metres, with a strong trunk and abundant foliage, creating a lush and verdant appearance (Figure 145).



Figure 145. Photograph of an ancient ginkgo tree from the Tang Dynasty. (Source: captured by the author)



Figure 146. Photograph of an ancient plum. (Source: captured by the author)

The ancient plum tree is located to the west of Agarwood Well and is said to have been planted by King Ling of Chu (楚灵王). During the winter and early spring seasons it blooms, releasing a captivating fragrance (Figure 146). Experts from the Wuhan

[313] 孙君恒，*《荆楚佛寺道观》*，（武汉：武汉出版社，2012），页 55 / Junheng Sun, *The Buddhist temple and Taoist monastery of Jingchu.*, (Wuhan: Wuhan Publishing House, 2012), p. 55.

Botanical Institute of the Chinese Academy of Sciences have verified that this plum tree is a native variety of 'Chimonanthus praecox', standing at a height of three metres with a crown spread of 6.5 metres, and it is over 2,500 years old. [314]

The ancient plum tree and the ancient ginkgo tree from the Tang Dynasty stand before the Great Buddha Hall of Zhanghua Temple, resembling two sentinels that guard the ancient structure. Together, they bear witness to this long-standing history.

During the historical period from the Qin to Yuan dynasties, the Jianghan Plain—serving as a pivotal cultural confluence within the Yangtze River Basin—evinced sustained and vigorous temple construction activities, the sheer quantity of which surpasses the illustrative cases enumerated herein. Through systematic collation and comparative analysis, the three temples selected in this chapter are revealed to possess distinct epochal representativeness in architectural style, spatial configuration, and cultural symbolism. Each embodies the construction techniques and sociocultural imperatives of its respective historical phase, thereby offering invaluable paradigmatic significance for investigating the historical evolution of temple architectural landscapes in the Jianghan Plain. Guided by principles of academic focus and systematic inquiry, this chapter foregrounds these three temples as core research subjects. By dissecting their architectural attributes, spatial morphologies, and cultural essences, it establishes a historical trajectory for the development of temple architectural landscapes in the region. While contemporaneous temple gardens exhibit notable architectural peculiarities and cultural articulations, they are excluded from this chapter's scope owing to constraints of textual brevity and thematic relevance.

[314] The Standing Committee of Jingzhou Municipal People's Congress, 'The Controversy Surrounding the Name of the Agarwood Well', *Jingzhou Daily*, 8 (2018), <http://www.jzrd.gov.cn/343/302.html> [accessed 11 March 2023].

Pagoda

Temples, as religious sites and monumental structures of Buddhist culture, represent a significant component of this cultural heritage. Typically situated in close proximity to temples or constructed independently, pagodas serve not only as vital symbols of the transmission and development of Buddhist culture but also exert a considerable influence on the regional landscapes of various historical periods.

In his writings, the esteemed Chinese architect Liang Sicheng classified traditional Chinese pagoda architecture into three categories: 1. Pavilion-style; 2. Cloistered eave-style; and 3. Bowl-cover style. Based on his descriptions of each type, this chapter analyses the characteristics of these pagodas. [315]

1. Pavilion-style pagodas typically feature an internal hollow structure, often incorporating stairs or a central column for ascension. These structures exhibit distinct floor divisions, each characterised by architectural elements such as corridors, flat platforms, and railings. The external appearance resembles traditional Chinese pavilion architecture, with prominent eaves that extend outward. Some pavilion-style pagodas are further adorned with decorative components like Dougong （斗拱） (bracket sets) beneath the eaves. Each level also includes flat platforms that allow individuals to circumnavigate the pagoda and enjoy the view, often equipped with protective railings. Windows and doors are systematically arranged, presenting diverse shapes, including square and circular forms, facilitating light and ventilation within the pagoda. The spatial dimensions of each level may vary, with the ground floor typically offering a larger space suitable for housing Buddhist statues and

[315] 梁思成，<中国的佛教建筑>，*《清华大学学报（自然科学版）》*，（02）1961，页 51-74. / Sicheng Liang, 'Buddhist Architecture in China', *Journal of Tsinghua University (Science and Technology)*, (02) 1961, pp. 51-74.

conducting religious ceremonies. As the number of levels increases, the spatial dimensions gradually decrease, allowing visitors to ascend the pavilion-style pagoda and take in distant vistas.

2. Cloistered eave-style pagodas feature a relatively simple internal structure, predominantly solid and not intended for climbing. These structures are often constructed from materials such as bricks and stones, stacked together without internal stairways or passageways for ascension, thus emphasising their sacred religious significance.

3. Bowl-cover style pagodas consist of three primary components: the base, the body (the bowl-cover form), and the finial. The base is typically designed in the form of a Sumeru pedestal, which is broad and stable, serving to support the pagoda's structure. This style is distinct from other pagoda types due to its unique bowl-cover shape. The body is rounded and robust, imparting a sense of grandeur and solemnity. The finial rises prominently, with uniquely shaped components, such as the finial wheel, serving as the visual focal point of the entire structure.

Currently, the field of archaeology has identified four Buddhist pagodas on the Jianghan Plain dating from the Tang to Yuan dynasties. These pagodas are distributed across various cities and their suburbs within the plain (Figure 147). Among these historically significant structures, the Hongshan Pagoda of Baotong Temple in Wuhan stands out as a prominent example due to its distinctive architectural style and rich cultural heritage. Field investigations of Baotong Temple reveal that the Hongshan Pagoda is situated on the temple's rear hillside (Figure 148). The pagoda's form is both austere and majestic; despite enduring the passage of time, it remains tall and imposing, exuding a powerful presence. This structure embodies substantial historical information and cultural significance, with its architectural design, sculptural artistry, and religious symbolism all meriting comprehensive scholarly examination. The following sections will provide a detailed analysis and discussion of these aspects.

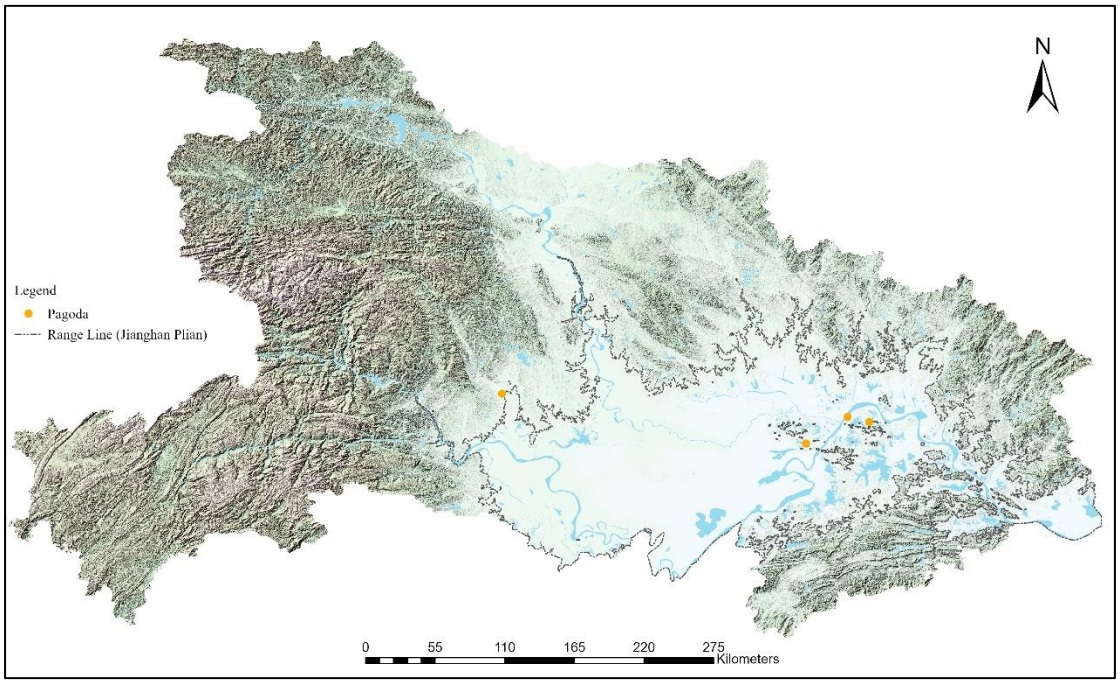


Figure 147. The distribution map of Buddhist pagodas in the Jianghan Plain during the Tang to Yuan dynasties. (Source: created by the author, use ArcMap, based on ‘中国国家文物局主编，《*中国文物地图集（湖北分册）*》,（西安：西安地图出版社，2002），页 66-67. / Edited by the National Cultural Heritage Administration of China, *Cultural Relics Atlas of China (Hubei Volume),* (Xi’an: Xi’an Map Press, 2002）, pp. 66-67.)



Figure 148. A photograph depicting the location of the Hongshan Pagoda. （Source: captured by the author）



Figure 149. Photograph depicting the intricate details of the stone eaves of Hongshan Pagoda. （Source: captured by the author）

As previously mentioned in this chapter, the rulers of the Yuan Dynasty held Tibetan Buddhism in high esteem, which may have influenced the Jianghan Plain region to some extent. However, during this period, there is likely no significant transformation in the architectural style and layout of temples; any changes would primarily be reflected in minor details influenced by Yuan culture and artistic styles. According to the *Hongshan Baotong Temple Gazetteer (《洪山宝通寺志》)*, the Hongshan Pagoda, known initially as Lingji Pagoda, was first constructed during the Yuan Dynasty. At its inception, each tower level featured wooden eaves and railings, while the surrounding area consisted of a brick and wood cloister. Each octagonal level was adorned with wind chimes. Inside the tower, a spiral staircase allowed access to windows and doors on each level, arranged in an alternating pattern (Figure 149). This indicates that although the tower was built during the Yuan Dynasty, it continued to follow the indigenous tradition of pagoda-style Buddhist towers, with the details of the structure adhering to the stylistic conventions of Han Buddhism. These details further substantiate the arguments presented earlier in the text.

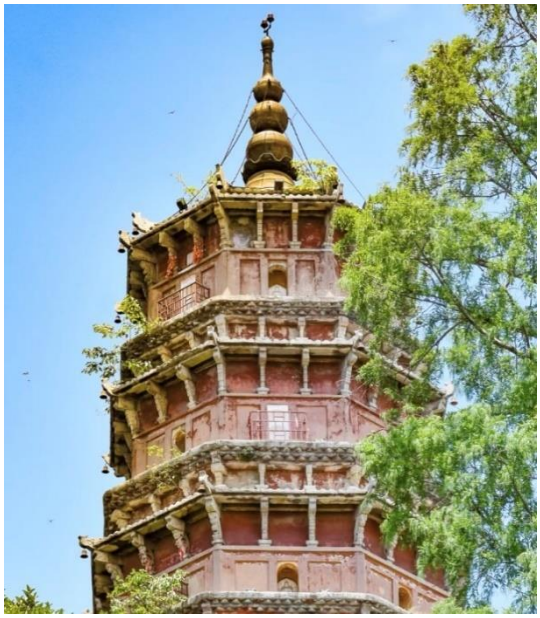


Figure 150. The bronze pinnacle of the Hongshan Pagoda. (Source: captured by the author)

Over the years, the Hongshan Pagoda has undergone continual restoration due to the

ravages of time and weather. Unfortunately, during the Xianfeng period of the Qing Dynasty (1851-1861), the pagoda lost its apex due to war. In an effort to restore the pagoda to its former glory, a major renovation project was undertaken in the tenth year of the Tongzhi period (1871), which was completed by the thirteenth year of Tongzhi (1874). This renovation involved replacing the original wooden eaves with stone eaves, converting wooden railings to iron, and transforming the surrounding corridor into octagonal stone steps.[316] Additionally, the pagoda's height was increased by five feet, and a copper structure weighing 6500kg was added to ensure its stability (Figure 150). However, due to frequent outbreaks of warfare in the subsequent years, the Pagoda still suffered significant damage. In 1953, the local government undertook its first comprehensive restoration, addressing the substantial damage caused by the conflicts. In 1980, a systematic renovation of the structure and external decorations of the Hongshan Pagoda was carried out, resulting in its current state of preservation. According to the records in the *Wuhan City Chronicle (《武汉市志》)*:

> The restored Baotong Pagoda is five feet taller than the original, with stone eaves replacing the wooden ones, iron railings replacing the wooden ones, and the surrounding corridor converted to octagonal stone. More than 200 stone steps were added to the mountain gate. The pagoda consists of seven stories with eight faces, each featuring windows surrounded by iron railings. It stands at a height of 44.1 meters, with a base circumference of 37.3 metres and a top width of 4 metres. [317]

The Baotong Pagoda, as it stands today, exemplifies a remarkable integration of the pagoda and monastery. Its grand scale and design make it a notable cultural landscape in the Jianghan Plain.

Conclusion

[316] 骆帆，〈宝通寺研究：传承、演变与影响〉，（硕士论文：中南民族大学，2016）/ Fan Luo, 'Research on Baotong Temple: Heritage, Evolution, and Influence', (Master Thesis: South Central Minzu University).

[317] Wuhan Local Chronicles Compilation Committee, 'Baotong Temple', *Wuhan Chronicles: Social Volume*, 2017 < http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1111/category_id/434828.html > [accessed 20 March 2023].

In summary, from the Qin Dynasty to the Tang Dynasty, and even into the Yuan Dynasty, historical documentation and research regarding the Jianghan Plain remain relatively limited. On the one hand, the considerable temporal distance from the present day, coupled with frequent warfare during this period, has resulted in a scarcity of landscape structures in this region compared to those preserved from modern Chinese history, including the Ming and Qing Dynasties. The current focus of archaeological excavations in the Jianghan Plain primarily centres on the Neolithic and Bronze Ages, further contributing to the lack of substantial archaeological findings pertaining to the period from the Qin to the Yuan Dynasties. Consequently, this chapter primarily relies on historical literature research, supplemented by archaeological reports, to explore the landscape evolution of the Jianghan Plain during this timeframe. Specifically, it examines aspects such as the evolution of the ancient lake district of Yunmengze, constructing embankments for land reclamation, water conservancy embankments, settlement landscapes, and Buddhist landscapes, including temple gardens and pagodas.

Overall, during the majority of the period from the Qin to the Yuan dynasties, the development of landscapes entered a relatively slow phase compared to the Neolithic and Bronze Ages. Throughout this historical period, the population density in the Jianghan Plain was relatively low, particularly before the Tang Dynasty. The central region of the Yangtze River, along the riverbanks, had a sparse population, and the level of economic development in the Jianghan Plain was limited. This area did not achieve comprehensive development, with much of its land remaining in a relatively primitive natural state.

It was not until the gradual development of the Jianghan Plain from the Tang to the Song dynasties that there was an increase in activities such as the construction of dikes

and reclamation of wetlands, which contributed to a gradual rise in population and a diversification of socio-economic activities. Consequently, relevant records also began to increase. Following the Tang and Song dynasties, the Jianghan Plain entered a period of explosive economic growth, with Jingzhou at its core, establishing itself as a regional political and economic centre. The connections between settlements became tighter, leading to the formation of a more integrated urban-rural system.

Yunmengze, a notable ancient lake cluster in the Jianghan Plain, underwent significant lacustrine evolution during this period. Factors such as sediment accumulation in rivers, human activities, and climate change gradually transformed Yunmengze from a vast lake into a network of scattered wetlands. This transformation not only altered the local natural landscape but also had profound effects on agricultural production and the ecological environment.

During the period from the Qin Dynasty to the Yuan Dynasty, agricultural development in the Jianghan Plain was consistently advanced, with an expansion of cultivated land. Over time, agricultural activity gradually shifted from the periphery of the plain to its central regions. Prior to the Qin Dynasty, large areas of lakes and marshlands existed in parts of the Jianghan Plain, and human activities were primarily concentrated in the higher, marginal areas. However, beginning with the Qin and Han Dynasties, population growth and the preliminary development of water conservancy technologies facilitated the cultivation of land in the interior of the plain, leading to a continuous expansion of farmland. By the Tang and Song Dynasties, the Yunmengze ancient group lake had largely disappeared, and more land had been developed for agriculture, solidifying the agricultural production zones of the Jianghan Plain.

In this period, local governments organized the construction of irrigation channels,

dams, and other hydraulic infrastructure, such as the continuous development of large-scale projects like the Jingjiang Dike, which significantly influenced flood control and safety in the Jianghan Plain. In addition to these large-scale hydraulic projects, numerous small-scale irrigation facilities, such as ponds and wells, were also widely constructed by local communities. These smaller facilities provided irrigation water for surrounding farmland, thereby facilitating agricultural production and improving the living conditions of farmers. Consequently, land utilization rates increased during this period. People continually transformed the terrain by constructing dikes and levees to convert low-lying, flood-prone areas into arable land, thereby enhancing land productivity. For instance, dykes were built to block floodwaters, enabling agricultural activities within these protected areas, which were previously susceptible to flooding. These developments underscore the enhanced capacity of people during this historical period to modify their natural environment.

In terms of settlement morphology and scale, the numerous settlements in the Jianghan Plain during the Qin to Yuan Dynasties were similarly located near the Yangtze River, the Han River, and their tributaries, as seen in the Bronze Age. Water remained a crucial resource for the livelihoods of the inhabitants, playing a pivotal role in the formation and development of these settlements. However, archaeological remains and documentation pertaining to this historical period in the Jianghan Plain are relatively sparse, leading to only limited clues being available for exploration. Among these clues, one of the most noteworthy is the emergence of a residential pattern that diverges significantly from previous models—water-based habitation. This settlement pattern primarily arose due to the frequent flooding in the Jianghan Plain, with residents largely relying on fishing for their sustenance. The types of settlements during this period can be categorised into two main models: migratory water-based settlements and migratory bird-like settlements. The former refers to a combination of water dwellings, such as boats and rafts, creating floating communities that adapt to the water's fluctuations. The latter is predominantly found in rural areas along the plains, characterised by residents

who choose to live on land or on boats based on the changing seasons. However, this type of settlement pattern gradually declined after the Yuan Dynasty, around the Ming Dynasty, suggesting that as the majority of people enhanced their capacity to modify their environment, unique elements reliant solely on adaptation to the environment may have diminished as well.

Aside from the water-based settlement model, terrestrial settlements remain the predominant residential pattern in the Jianghan Plain. During the historical period from the Qin to the Tang dynasties, the distribution of settlements in the Jianghan Plain was generally sparse. This period was marked by significant political upheaval in China, including multiple wars, which led to large-scale population migrations across different regions. It was not until after the Tang dynasty that the political stability of the state was re-established, allowing the Jianghan Plain, with its favourable natural conditions, to once again attract inhabitants for settlement and reproduction, gradually leading to the formation of numerous villages and cities. However, the frequent social unrest and warfare during this time necessitated the enhancement of urban defensive structures. Fortifications such as city walls and moats were widely constructed to ensure the safety of residents. For instance, the ancient city walls of Jingzhou underwent multiple reconstructions and reinforcements throughout history, becoming significant military defensive installations. This approach clearly differed from the strategies employed in earlier historical periods, where reliance was primarily on natural topography, supplemented by some human modifications (such as the construction of earthen walls and moats). In contrast, during this later period, communities undertook more extensive modifications and constructions based on the foundations laid by their predecessors.

During this historical period, Buddhist culture experienced significant development, with Buddhism and other religious traditions spreading extensively across the Jianghan Plain. During this time, temples and pagodas in the region evolved from nonexistence

to presence, undergoing a transformation from simple structures to more complex and larger edifices. This evolution marked the emergence of religious landscapes within the public consciousness. This process not only reflects the propagation and growth of Buddhism in the area but also illustrates how the political, economic, and cultural contexts of different historical periods influenced religious architecture. The construction of numerous religious buildings, such as temples and pagodas, became vital manifestations of the community's religious beliefs, contributing to a distinctive cultural landscape. Noteworthy examples include Qingning Zen Temple, Dongguan Temple, and Tang'an Ancient Temple, all of which were established during the Tang Dynasty, as well as Baotong Temple, which dates back to the Wei, Jin, and Northern and Southern Dynasties, and the Hongshan Pagoda, initiated during the Yuan Dynasty. The Hongshan Pagoda, one of the few surviving pagodas on the Jianghan Plain, integrates harmoniously with the surrounding natural environment and temple architecture, creating a unique spatial aesthetic. Its design has rendered it a remarkable cultural landmark on the Jianghan Plain, a legacy that continues today.

Chapter 6. From the Ming Dynasty to the Qing Dynasty (1368-1912): Stable Development of Aquatic Systems and Agricultural landscapes

Introduction

The period of the Ming and Qing dynasties spans from 1368 to 1912 AD. During this historical epoch, humanity had acquired certain production technologies, gradually transitioning from merely adapting to nature to a stage of partial transformation of the natural environment, ultimately leading to a phase of proficient modification of nature. This shift rendered human activities a significant factor influencing changes in the natural environment during this period. To comprehend the evolution of landscapes within this historical timeframe, it is essential to thoroughly examine the demographic changes in the Jianghan Plain during the Ming and Qing periods.

During the early Ming Dynasty, the population of the Jianghan Plain experienced a significant decline due to the turmoil of the late Yuan Dynasty, which led to widespread land degradation. The Huguang [318] (湖广) emerged as a primary site of conflict during the transition between dynasties, making the Jianghan Plain one of the areas severely impacted by warfare.[319] Vast tracts of farmland fell into disuse, a situation that has already garnered attention from researchers. The issue of land desolation within the Jianghan Plain presents a more complex scenario compared to other regions, characterized by at least three notable aspects:

1. Deterioration of Embankments: The Jianghan Plain features a network of rivers and lakes, creating a landscape typical of water-rich regions, where

[318] During the Ming and Qing dynasties, 'Huguang' primarily referred to the present-day provinces of Hubei and Hunan in China.

[319] 德廉，袁鸣珂（清），<杂记>，*《汉川县志.卷22》*/ Lian De, Mingke Yuan (Qing Dynasty), 'Miscellaneous Notes', *Annals of Hanchuan County (Volume 22).*

embankments are crucial for large-scale agricultural production. Prolonged warfare led to the deterioration of these embankments, either through neglect in repairs or due to the social upheaval that precluded restoration efforts. Without proper maintenance of the embankments, efforts to restore large areas of farmland were rendered impossible.

2. Severe Relocation of Farmland: More critical than the abandonment of farmland is the displacement of land in relation to rivers and lakes. The Jianghan lake system consists of shallow, sedimentary lakes, which are prone to Silt deposit. Since the Yuan Dynasty, increased development in the upstream mountainous areas has exacerbated sediment accumulation carried by inflowing waters. As a result, areas prone to flooding or sediment accumulation have been elevated to the level of surrounding land, while fields shielded by embankments have become depressions over time. Concurrently, as many lakes in the Jianghan Plain disappeared after the Yuan Dynasty, new bodies of water and lakes emerged continuously.

3. Confusion of Land Boundaries: Alongside the desolation of farmland, there was also a blurring of land demarcations, leading to unclear property rights or usage rights. The sedimentation of rivers and lakes, along with the shifting of land to water surfaces, obscured the original territorial boundaries, resulting in ambiguous land ownership.

To promote agricultural production and economic development, the Ming government implemented a series of measures to encourage immigration, primarily attracting individuals from surrounding areas of the Hubei Province.[320]

During the Qing Dynasty, the patterns of population migration in the Jianghan Plain

[320] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 382-384. / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), pp. 382-384.

exhibited distinct characteristics. An excerpt from the ancient text *Discussion on Water Management in Huguang (《湖广水利论》)* provides insight into the migration of people from the Huguang region during the late Ming and early Qing dynasties:

> In the late Ming Dynasty, Xianzhong Zhang [321] conducted massacres in Sichuan, leading to a near-total decimation of the local population. The Huguang region experienced significant turmoil, albeit to a lesser extent than Sichuan, while Jiangxi suffered relatively little damage. Once the situation stabilized, a phenomenon of population migration emerged, with people from Jiangxi moving to Huguang and those from Huguang migrating to Sichuan. Consequently, there was a popular saying at the time: Jiangxi fills Huguang, and Huguang fills Sichuan.[322]

This migration reflects the societal upheaval of the era and the varying degrees of impact that the conflicts had on different regions. It profoundly influenced the demographic structure, economic development, and cultural integration in both the Huguang and Sichuan regions.

The Jianghan Plain, as a significant component of the Huguang region, emerged as a crucial stage for population migration during that period. This wave of immigration continued until the mid-Qing Dynasty, when a large influx of migrants from Jiangxi entered the Jianghan Plain.[323] These individuals, whether accompanied by their families or travelling alone, sought refuge from war and sought more fertile land and improved living opportunities.

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[321] Xianzhong Zhang (1606–1647) was a leader of the peasant army during the late Ming Dynasty.

[322] 魏源（清），*《湖广水利论》* / Yuan Wei (Qing Dynasty), *Discussion on Water Management in Huguang.*

[323] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 383 / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), p. 383.

In the Jianghan Plain, immigrants from Jiangxi coexisted and collaborated with the indigenous population, gradually giving rise to a new social landscape. These immigrants introduced cultural traditions, agricultural techniques and lifestyle practices from Jiangxi, which intermingled with the native culture of the Jianghan Plain, ultimately creating a rich and diverse regional culture. [324] Over time, the population in the Jianghan Plain continued to expand, leading to more intensive development and utilization of the land, which significantly enhanced agricultural productivity during this historical period. The influx of a large number of immigrants generated increased opportunities for commercial trade, further promoting economic development in the Jianghan Plain region. However, as the population steadily grew, the limited land resources of the Jianghan Plain began to approach saturation, leading to emerging issues of resource scarcity. [325] Some residents of the Jianghan Plain began to look towards more distant regions, such as Sichuan, in order to achieve a dynamic balance in the overall population.

As indicated in the preceding discussion, during the mid-Ming Dynasty, a significant influx of immigrants led to rapid population growth in the Jianghan Plain, and the local inhabitants increasingly demanded the expansion of new agricultural land. The phrase 'As Huguang has a bumper harvest, the whole country will have enough food.' [326] (‘湖广熟，天下足’) derives from Fuyuan Li's *Comprehensive Atlas (《地图综要》)* written in the late Ming to early Qing period, indicating that during the Ming and Qing dynasties, Hunan and Hubei provinces were significant producers of rice. Once the Huguang region achieved a bountiful harvest, it provided a reliable guarantee for the

[324] 方盈，‘堤垸格局与河湖环境中的聚落与民居形态研究’，（博士论文：华中科技大学，2016），页 41. / Ying Fang, 'Settlement and Dwellings Patterns in the Hydrological Environment Crisscrossed with Rivers and Lakes: Illustrated by the cases Around the River and Lake Area of Jianghan Plain during Ming and Qing Dynasties to the Republic of China', (Doctoral Thesis, Huazhong University of Science & Technology, 2016), p. 41.

[325] 翟世航，‘明清时期江汉平原环境变迁研究’，（硕士论文：华中师范大学，2011），页 40. / Shihang Zhai, 'Research on Environmental Evolution of Jianghan Plain in the Ming and Qing Dynasty', (Master's Thesis, Central China Normal University, 2011), p. 40.

[326] 李釜源（明），*《地图综要》* / Fuyuan Li (Ming Dynasty), *Comprehensive Atlas.*

national grain supply. This highlights the crucial role of the Huguang region in China's grain supply, with the Jianghan Plain serving as a vital rice-producing area within this region. During this historical period, the agricultural land developed in the Jianghan Plain primarily consisted of polder fields. [327] The fundamental construction method for these fields involved building embankments in shallow marshy areas, enclosing the rice paddies while preventing water from entering. Utilizing the local topography, farmers constructed earthen dykes to separate the waters of rivers and lakes from their fields, safeguarding crops from flood damage. The emergence and development of polder fields significantly enhanced land-use efficiency, increased grain production and fostered agricultural prosperity and economic development in the Jianghan Plain, establishing it as one of China's crucial grain centres during that era.

The increasing agricultural reclamation and the escalating exploitation of natural resources by humans have gradually led to significant changes in the ecological environment. Consequently, the development of paddy fields has had detrimental effects on the natural environment of the Jianghan Plain. During the mid-Qing Dynasty, the extent of land utilization in the Jianghan Plain reached alarming levels due to extensive reclamation, resulting in severe consequences. [328] The excessive construction of embankments obstructed water flow, elevated water levels, and heightened the risk of flooding. During the Ming and Qing Dynasties, floods occurred frequently in the Jianghan Plain, a phenomenon closely linked to the overdevelopment of paddy fields.[329] Therefore, the subsequent sections of this chapter will provide a

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[327] 张正明，刘玉堂，*《湖北通史-明清卷》*，（武汉：华中师范大学出版社，1999），页：231-232. / Zhengming Zhang, Yutang Liu, *General History of Hubei: The Ming and Qing Dynasty Volume,* (Wuhan: Central China Normal University Press, 1999), pp. 231-232.

[328] 梅雪芹，倪玉平，李志英等，*《中国环境通史（第四卷）》*，（北京：中国环境出版集团，2019），页：12. / Xueqin Mei, Yuping Ni, Zhiying Li, and others, *The Environmental History of China (Volume 4),* (Beijing: China Environment Publishing Group, 2019), p. 12.

[329] Youle Zhu, 'Human competition for land with water results in disaster, as water inevitably competes with humans for territory — Reflections on 'As Huguang has a bumper harvest, the whole country will have enough food', *People's Government of Xiaonan District Website*, 2015. < http://www.xiaonan.gov.cn/hywx/950052.jhtml >

detailed analysis of the paddy field landscape in the Jianghan Plain.

In this historical context, the ecological environment of the Jianghan Plain deteriorated significantly. Human production activities led to the destruction of forest vegetation, resulting in a substantial decrease in forest cover. The severe damage to natural vegetation exacerbated soil erosion and water loss, while the indiscriminate development of paddy fields narrowed rivers and lakes, increasing the flow velocity of river water. This, in turn, led to a reduction in flood storage capacity, with many ancient lakes being filled with sediment. The once expansive ancient Yunmengze lake cluster significantly diminished by the time of the Ming and Qing dynasties.[330] It is not difficult to infer that during the Ming and Qing periods, the Jianghan Plain was particularly susceptible to anthropogenic floods and droughts.

From a macro perspective, the significant development undertaken by the inhabitants of the Jianghan Plain during this period resulted in a distinctive landscape characterized by a multitude of lakes, an intricate network of waterways, and an extensive system of dikes and embankments which reflected the features of a typical plain water town. The allure of immigration policies attracted a substantial influx of external populations, leading to rapid population growth and the introduction of diverse regional cultures. This demographic shift spurred swift economic development in the Jianghan Plain, with notable advancements in agriculture, commerce, and handicrafts. As a result, numerous towns and villages emerged, each shaped by their unique cultural influences, which contributed to the establishment of distinct architectural styles in residential buildings.[331] The expansion of these towns and villages necessitated further

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[accessed 03 May 2023].

[330] 张兰生，方修琦，《*中国古地理*》，（北京：科学出版社，2005），页 350-351. / Lansheng Zhang, Xiuqi Fang, *Ancient Chinese Geography,* (Beijing: China Science Publishing, 2005), pp. 350-351.

[331] 叶隽，周百灵，<江汉平原传统民居聚落形态演变研究>，《*江苏建筑*》，2（2012），页 7-8. / Jun Ye, Bailing Zhou, 'A Study on Evolution of Traditional Vernacular Settlement Formation in Jianghan Plain', *Jiangsu*

development and utilization of land resources, which, in turn, facilitated the construction and improvement of transportation networks. This dynamic process rendered the landscape of the Jianghan Plain increasingly diverse and complex. This chapter includes an in-depth exploration of the landscape associated with these villages.

In summary, the landscapes of the Jianghan Plain during the Ming and Qing dynasties were significantly influenced by human society. Human activities transformed and utilized the natural environment to an unprecedented extent. For instance, the development of terraced fields, the improvement of water conservancy projects and the rise of towns and villages exemplify this transformation. While these human efforts resulted in a more habitable built environment, the excessive development also imposed negative impacts on the ecological environment of the Jianghan Plain. This chapter will provide a detailed analysis of these aspects.

Polder Agricultural Landscape

The polder agricultural landscape is a distinctive feature of the Jianghan Plain during the Ming and Qing dynasties and serves as a quintessential representation of the local cultural landscape in the region. This landscape is characterized by a land-use strategy adopted by local residents to enhance their living conditions and generate positive economic returns. The cultural landscape resulting from the human modification and utilization of the natural environment is considered a regional landscape belonging to the local community. The large-scale construction and development of polder fields on the Jianghan Plain predominantly occurred during the Ming and Qing periods, with a tendency toward saturation emerging in the mid-Ming dynasty.[332]

Construction, 2 (2012), pp. 7-8.

[332] 汪峰，<长江中游人居景观研究-脉络梳理及可持续发展之路的探索>，（博士论文：重庆大学，2010），页 49. / Feng Wang, 'Study on Human Settlements Landscape in Middle Reaches of Yangtze River – Cultural

Morphology of polder field landscapes

The practice of polder fields has been recognized as a significant traditional agricultural land-use method since the Yuan Dynasty. Notably, Zhen Wang （王祯）, in his work *Agricultural Book (《农书》)*, incorporated polder fields into the formal categorization of land use known as the 'Agricultural Field System'. This classification and description were subsequently adopted in later agricultural texts, including Complete *Treatise on Agricultural Administration (《农政全书》)* by Guangqi Xu (徐光启) and *Collected Works on Agriculture According to Seasonal Climates (《授时通考》)*, a work authored by officials during the Qing Dynasty. Wang's *Agricultural Book (《农书》)* provides a detailed account of the structure of polder field, stating:

> The local residents observe the topography and construct earth embankments that enclose the polder field area without any breaks; within this enclosed area, which spans several hundred to over a thousand hectares, land is cultivated for crops.[333]

This statement elucidates the construction methods and scale of polder fields, emphasizing the creation of continuous earth embankments to delineate large areas, which are then transformed into arable farmland.

During the Ming and Qing dynasties, the agricultural economy of the Jianghan Plain experienced significant growth, particularly in grain production. This enhancement was largely attributable to the large-scale construction of paddy fields. The construction of

Heritage Context and Sustainable Development', (Doctoral Thesis, Chongqing University, 2010), p. 49.

[333] 王祯（元），*《农书》*/ Zhen Wang (Yuan Dynasty), *Agricultural Book.*

dykes and the reclamation of paddy fields greatly strengthened the status of the Jianghan Plain within China's agricultural economy during this period. Historical documents contain extensive accounts regarding the paddy fields of the Jianghan Plain, including the twentieth volume of the *Jingzhou Prefectural Gazetteer* (*《荆州府志》*) which states: 'In rural areas, people build dykes around their fields to prevent flooding. The enclosed area formed by these dikes is referred to as a polder field.'[334] Similarly, the fourth volume of the *Tianmen County Gazetteer (《天门县志》)* notes, 'Along the rivers, large dikes are constructed, and residents within these dykes designate specific areas to build their own dykes for protection, collectively referring to these regions as polder fields.' [335] The eighth volume of the *Jiangling County Gazetteer (《江陵县志》)* describes, 'In ancient times, the Jiangling region was characterized by marshy areas rich in aquatic vegetation and inhabited by fish and turtles. Residents constructed enclosing dykes on elevated land near the water to cultivate farmland, also termed polder fields. Within the polder field, there were lakes, while the elevated land formed the outer perimeter, thus situating the river as the body of the field, with the high ground serving as its neighbour.[336]

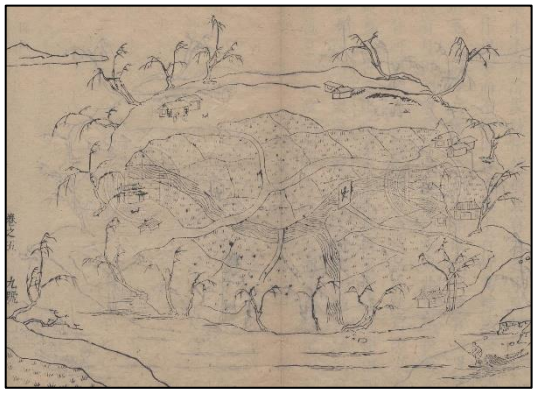


Figure 151. Illustrations of polder field in ancient texts. (Source: Zhen Wang (Yuan Dynasty), *Agricultural Book (Volume 5)*, National Digital Library of China.

Based on the information recorded in this ancient literature, it is evident that the primary function of the polder fields was to serve as a protective water barrier. In addition to the surrounding levees, the structure of polder fields encompassed various elements such as the fields, levees,

[334] 郭茂泰（清），*《荆州府志（第 20 卷）》*/ Maotai Guo (Qing Dynasty), *Jingzhou Prefectural Gazetteer (Volume 20).*

[335] 王希琮（清），*《天门县志（第 4 卷）》*/ Xicong Wang (Qing Dynasty), *Tianmen County Gazetteer (Volume 4).*

[336] 崔龙见（清），*《江陵县志》*/ Longjian Cui (Qing Dynasty), *Jiangling County Gazetteer (Volume 8).*

and water bodies. Leveraging these components, the interior of a polder field was equipped with various landscape features, including sluices, houses, and vegetation (Figure 151).

During the Ming and Qing dynasties, the Jianghan Plain, located in the middle reaches of the Yangtze River, experienced frequent flooding, leading to significant alterations in river courses. [337] After each flood receded, extensive areas of silt flats were left behind. The fertile alluvial land of the lakeshores and riverbanks gave rise to the cultivation of polder fields adapted to this landscape. The polder fields in the Jianghan Plain were constructed in low-lying areas susceptible to flooding, utilizing embankments to protect agricultural land and settlements from water inundation. The embankments and polder fields formed an inseparable system: the residents living along the river and lakeshores gradually built levees around their fields to mitigate flood risks, eventually leading to the development of polder fields.

The term polder fields refers to agricultural lands that have been constructed with dykes to protect against flooding. The presence of these dykes serves as a defining characteristic of enclosed fields, which function primarily as flood defences. In ancient times, people-built embankments to create fields that were enclosed on the inside and surrounded by water on the outside. Enclosed fields are anthropogenic modifications, a secondary wetland that emerged from the development of natural wetlands. Following the disintegration of the ancient Yunmengze Lake complex, much of its area was transformed into flat land due to sediment accumulation during the Ming and Qing dynasties, resulting in a scattered distribution of small lakes. This alteration of the natural landscape provided an excellent environment for the construction of enclosed

[337] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 447-454. / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), pp. 447-454.

fields and the formation of agricultural landscapes, a model that continues to be utilized today.

The scale of the polder fields varies significantly, ranging from a few hectares to over ten square kilometres. Regardless of size, the fundamental structure of yuan-tian can be classified into three main components: the embankments, sluice gates and river channels. In certain structurally essential yuan-tian, people typically utilize shallow areas within the water body to cultivate reeds and lotus flowers, while flood-resistant trees such as poplars and elms are planted in slightly elevated positions. Over several years, these plants gradually contribute to sediment accumulation, forming natural banks. These plantings have been documented in various literary works by ancient scholars. For example, Xinchuan Li in his text, *Miscellaneous Records of the Court and the Country since the Jianyan Period (《建炎以来朝野杂记》),* describes the vegetation landscape along the banks of yuan-tian:

> The embankments of the polder field resemble long dams, with rows of elm and willow trees planted along them, creating a picturesque scene from a distance.[338]

The renowned Song Dynasty poet Wanli Yang discusses in his poem *Polder Fields (《圩田》)*:

> Since ancient times, green poplars have been planted along the embankments of polder field. However, as time passes, soil erosion occurs, leaving the roots of the poplar trees exposed, ultimately causing them to lean into the central water body.[339]

In the context of the polder field system, in addition to the external embankments, it is

[338] 李心传（宋），*《建炎以来朝野杂记》*/ Xinchuan Li (Song Dynasty), *Miscellaneous Records of the Court and the Country since the Jianyan Period.*

[339] 杨万里（宋），*《圩田》*/ Wanli Yang (Song Dynasty), *Polder Fields.*

common to construct internal dykes in conjunction with the river channels within the paddy fields.[340] These internal dykes typically serve as access roads within the polder fields. The primary function of the internal network of water channels is to facilitate irrigation and manage excess water. These channels are often connected to external rivers and equipped with sluice gates, enabling them to also function as transport routes. The channels at both ends extend directly to the embankments of the paddy fields, creating a complex structure characterized by interconnectivity and regulation, where rivers exist within fields and fields coexist with rivers (Figure 152).



Figure 152. Aerial imagery of the current state of the polder fields in the Jianghan Plain. (Source: captured by the author)

In field investigations of multiple polder field areas in the Jianghan Plain region, it was observed that the land can generally be categorized into three distinct types. The first, defined by elevation, consists of dry land, typically used for cultivating crops such as wheat, cotton, and legumes. The second type is paddy fields, where traditional crops like rice are grown. The third type is lake fields, which are situated in low-lying areas with high groundwater levels, significantly impacting crop yields. These lake fields are often excavated by local farmers for use as reservoirs, and they also serve a dual purpose for aquaculture. Due to the frequent flooding in the Jianghan Plain, much of the polder field area experiences a cycle where water inundates the land during flood periods and

[340] 孙峻（清），《*筑圩图说*》 / Jun Sun (Qing Dynasty), *Illustrated Explanation of Building Polders*.

recedes to reveal arable land, resulting in nutrient-rich soil that is highly conducive to crop growth.

Taking Paizhouwan Town, located in the southeastern part of the Jianghan Plain, as an example, the earliest record of polder fields in this area appears in the Yuan Dynasty, as documented in the *Jiayu County Gazetteer (《嘉鱼县志》)*. At that time, these fields had not yet developed on a large scale. However, during the Ming Dynasty, there was a notable expansion of these fields. Today, the low-lying areas along the banks of the Yangtze River continue to employ the agricultural practice of creating fields by enclosing lakes, resulting in extensive polder fields.

Paizhouwan Town is situated in a unique geographical position, bordered on three sides by the Yangtze River (Figure 153). This distinct location subjects its residents to frequent flood threats. As mentioned in previous sections, the ancestors living in the Jianghan Plain benefited from the fertile land and abundant water resources provided by the ancient Yunmengze lake cluster, which contributed to their economic prosperity. Whenever the floodwaters recede, the soil in this region becomes extremely fertile, promoting agricultural growth. By contrast, the early inhabitants of this area had only limited capacity to withstand flood disasters, rendering them vulnerable to persistent inundation and forcing them to endure the negative consequences associated with flooding.



Figure 153. Map depicting the positional relationship between Paizhouwan Town and the Yangtze River. (Based on the Google Earth)



Figure 154. Satellite imagery analysis of the surrounding landscape of polder fields in Paizhouwan Town. (Source: Based on the Google Earth)

Humans do not remain passive in the face of adversity. As previously mentioned in earlier chapters of this thesis, large-scale construction of flood control facilities, such as levees, began as early as the Qin and Yuan dynasties. The flood control infrastructure in the Paizhouwan Town, including levees, can be distinctly identified using Google Earth (Figure 154). Historical records indicate that the levee near the Yangtze River dates back to the Yuan dynasty.[341]

[341] 汪云铭，方承保，张宗轼（清），《*嘉鱼县志*》 / Yunming Wang, Chengbao Fang, and Zongshi Zhang (Qing Dynasty), *Jiayu County Gazetteer*.



Figure 155. Poplar trees along the Yangtze River levee. (Source: captured by the author)

Through a prolonged struggle between the residents and the natural environment, this approximately 84-kilometre-long levee has been repeatedly rebuilt and reinforced.[342] It serves not only as a hydraulic structure ensuring the safety of the residents but also as a crucial element in the formation of the polder field landscape. Its presence significantly contributes to the implementation of paddy agriculture and the development of the polder field ecosystem. During field investigations, it was observed that numerous poplar trees were planted along the side of the levee adjacent to the Yangtze River, which, according to research, serve the purpose of protecting against riverine flooding (Figure 155). On the opposite side of the levee lies an extensive area of polder fields. Due to the fertile soil and abundant water resources, irrigation for these agricultural lands is sourced from the Yangtze River and rainwater collection. The emergence of the polder field model not only effectively mitigates the risks posed by flooding but also provides an ideal growing environment for local crops, presenting a viable solution to address the living conditions of the local population. Currently, local farmers cultivate crops such as corn, rice and lotus



Figure 156. Photograph of the polder field landscape in the Paizhouwan Town. (Source: captured by the author)

[342] 湖北省嘉鱼县地方志编纂委员会，《*嘉鱼县志*》，（武汉：湖北科学技术出版社，1993），页 248. / Compilation Committee of Local Chronicles of Jiayu County, Hubei Province, *Jiayu County Gazetteer*, (Wuhan: Hubei Science & Technology Press, 1993), p. 248.

leaves in these fields. Together, they form a contemporary representation of the polder field landscape (Figure 156).

Overall, elements such as embankments, sluices, residential structures, water surfaces, and vegetation collectively form the diverse and intricate landscape of polder fields in the Jianghan Plain. These elements are interconnected through human activities such as cultivation, irrigation, drainage and navigation, resulting in the establishment of a localized societal structure within the region. Additionally, settlements have a significant impact on the polder field landscape, a topic that will be explored in detail in the subsequent sections of this chapter.

Villages in polder fields

During field investigations in the Jianghan Plain, it was observed that villages near the raised embankments of the polder fields are often concentrated along the roads on either side of these high platforms, typically exhibiting a linear arrangement (Figure 157), primarily characterized by a dispersed settlement pattern. A detailed examination of the history of some of these villages revealed a discernible pattern: as the population within a village increases, the housing tends to extend further into the polder fields, a process that is generally accompanied by adjustments to the rivers within the polder field area.



Figure 157. Schematic representation of the village model in the Zoumaling Village, Shishou City. (Source: created by the author, based on the Google Earth)



Figure 158. Photographs of residential houses in the polder field area. (Source: captured by the author)

The residences of each household in these villages are distributed sporadically, situated as closely as possible to the agricultural fields and lakes upon which the farmers depend for their livelihoods. The farmers' homes are located in proximity to the arable land, with the attraction between houses being significantly weaker than that between houses and the farmland. It is important to note that while the villages within or near the dyke areas primarily exhibit a dispersed settlement pattern, there are also concentrated villages existing simultaneously in the Jianghan Plain region during the same period. These concentrated villages consist of numerous rural residences clustered together, resulting in large communities where households live in close proximity to one another. Such villages typically feature public buildings, such as temples, opera stages and ancestral halls, which serve as focal points for the entire community. However, as these concentrated villages generally do not appear within the polder field areas, they will not be elaborated upon here; relevant information will be discussed in detail in the subsequent subsection of this chapter.

In the polder region, the houses in the villages are typically situated on elevated platforms within the expansive fields, often built on artificially created mounds adjacent to ditches or small ponds (Figure 158). Each platform functions relatively independently, with individual households constructed on distinct mounds that can be separated by distances ranging from several metres to hundreds of metres. Some residential buildings are surrounded by planted trees, which serve two primary purposes: first, to strengthen the foundation, and second, to provide a degree of shade for the structures. This approach is particularly effective for cooling purposes, as planting trees

on flat land can significantly contribute to temperature reduction. Some household dwellings are encircled by a pond formed from the soil excavated during the mound construction; this pond not only fulfils the domestic water needs of the residents but also serves as a habitat for fish (Figure 159). Between the platforms, rice paddies and vegetable gardens are typically cultivated, with winding pathways connecting the various farms. These pathways often delineate the boundaries of the different parcels of land.

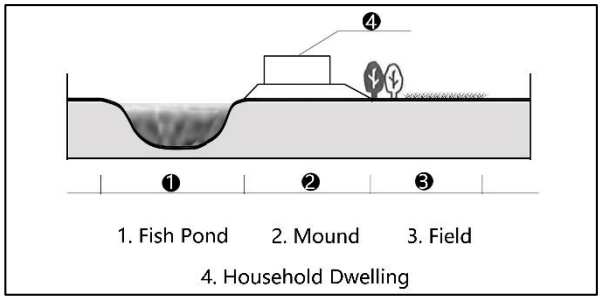


Figure 159. Diagram of residential courtyard housing. (Source: hand-drawn by the author)

It is noteworthy that during the field investigation, it was observed that the villages situated within the polder fields of the Jianghan Plain collectively encounter several practical challenges, including the dredging of waterways, flood control and drainage within the dyke fields, maintenance of the dyke embankments and the allocation of irrigation water. This suggests that, to some extent, each dyke-reinforced area functions as an independent hydrological society.

Polder field landscapes evolution

Although the emergence of the polder field system in the Jianghan Plain can be traced back to the late Song Dynasty, [343] its development was limited due to the relatively low population density during that period, with these fields primarily concentrated in the

[343] 梅莉，张国雄，晏昌贵，*《两湖平原开发探源》*，（江西：江西教育出版社，1995），页 87-134. / Li Mei, Guoxiong Zhang, Changgui Yan, *Exploring the Origin of the Development of the Plain of Hubei and Hunan.*, (Nanchang: Jiangxi Education Publishing House, 1995), p. 87-134.

central region around Mianyang. [344] The socioeconomic landscape of the Jianghan Plain was significantly adversely affected during the turmoil of the late Yuan Dynasty, resulting in a considerable decline in population and varying degrees of damage to irrigation systems and embankments. The *Mianyang Gazetteer (《沔阳志》)*, compiled during the Jiajing period of the Ming Dynasty (1522-1566AD), documents that:

> After enduring the calamities of war, Mianyang experienced a significant decline in talent and a reduction in population, resulting in vast tracts of land becoming barren and abandoned, left without proper management. [345]

reflecting the conditions in Mianyang, located in the heart of the Jianghan Plain, following the conflicts at the end of the Ming Dynasty.

Until the onset of the Ming Dynasty, the government undertook the reconstruction and remediation of the flood defences in the Jianghan Plain area, aiming to mitigate the detrimental impact of flooding on the residents' livelihoods, thereby restoring and developing the agricultural economy. As the Ming government organized large-scale immigration into the region, the extensive riverbanks and lakeshores of the Jianghan Plain were rapidly developed, and the cultivation of polder fields entered a phase of restoration. Volume Eight of the *Mianyang Gazetteer (《沔阳志》)*, titled 'River Defence Records (河防志)', documents the development of levee fields in Mianyang during this period:

> The construction of polder fields began to flourish during the Ming Dynasty, as the areas along the Yangtze River and Han River had stabilized. The populace gradually cultivated the land and constructed dikes. At this time, laws and regulations were clearly defined, and the community worked collaboratively,

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[344] Youle Zhu, 'Human competition for land with water results in disaster, as water inevitably competes with humans for territory — Reflections on 'As Huguang has a bumper harvest, the whole country will have enough food', *People's Government of Xiaonan District Website*, 2015. < http://www.xiaonan.gov.cn/hywx/950052.jhtml > [accessed 03 May 2023].

[345] 童承叙（明），《*沔阳志*》 / Chengxu Tong, (Ming Dynasty), *Mianyang Gazetteer*.

> resulting in strong and robust flood defences, with lakes and rivers being both deep and wide. Moreover, due to the limited number of polder fields and the expansive land, floods could spread widely when they occurred, allowing for areas where water could accumulate and drain. [346]

This account illustrates that the construction of polder fields experienced a resurgence during the Ming Dynasty, as people began to cultivate the land and erect sturdy embankments around the fields.

During the mid-Ming Dynasty to the early Qing Dynasty, a second large-scale influx of displaced populations, guided by the government, entered the Jianghan Plain region, significantly increasing the labour force available for the development of the plain's polder fields. This rise in labour prompted extensive construction of flood defences in the Jianghan Plain during the Ming period. Additionally, the sedimentation of rivers and lakes in the plain further facilitated the development of polder fields. Notably, the river outlets that served to divert water were also enclosed and blocked, leading to the formation of individual polder fields. As a result, the original environmental landscape of the Jianghan Plain underwent significant transformation, evolving into a densely populated agricultural base with a relatively high level of productivity. However, due to the vast expanse of land in the Jianghan Plain, the polder fields during the Ming Dynasty had not reached an ecological saturation point, preventing the emergence of water-related issues typically associated with the reclamation of land through water enclosure.

During the transition between the Ming and Qing Dynasties, agricultural lands known as polder field suffered extensive damage due to warfare, leading to the abandonment

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[346] 童承叙（明），<河防志>，*《沔阳志（第八卷）》* / Chengxu Tong, (Ming Dynasty), 'River Defence Records', *Mianyang Gazetteer (Volume 8)*.

of the majority of embankments and polders.[347] The development of polder fields in the Jianghan Plain during the Ming Dynasty laid the groundwork for the restoration and expansion of these lands in the Qing Dynasty, providing valuable experience for the Qing government in the construction and management of polder fields.

By the early Qing period, the influx of immigrants accelerated the growth of polder fields, which expanded more rapidly than during the Ming period and extended further into marshy lake areas and silted river ports. By the mid-Qing Dynasty (1662-1735), polder fields began to recover, ultimately surpassing both the quantity and scale seen in the Ming period. This resurgence in the construction of polder fields reached a new peak, approaching saturation levels. However, in subsequent years, the economic benefits of polder field led residents not only to maintain but also to increase the rate of construction, with more individuals engaged in the reclamation of these lands. All available lakes, rivers, and marshes were gradually enclosed and developed.

In the third volume of the ancient text *Hanchuan Tuji Zhengshi (《汉川图记证实》)*, specifically in the chapter on 'Embankments and Polders (堤垸)', it is recorded:

> As sediment continuously accumulates, people proceed to construct polder field. Wherever lakes, canals, and marshes are filled with sediment, people eagerly cultivate and build embankments.[348]

This observation reflects the proactive approach of the inhabitants of the Jianghan Plain towards land resource development during this historical period. They sought to expand arable land by constructing dykes on silted areas to meet agricultural production and

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[347] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 416 / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), p. 416.

[348] 田宗汉（清），<堤垸>，*《汉川图记证实（第三卷）》*，页 26. / Zonghan Tian, (Qing Dynasty), 'Embankments and Polders', *Hanchuan Tuji Zhengshi (Volume 3),* p. 26.

living needs.

During the late Qing period, relentless human efforts to reclaim land from lakes in the Jianghan Plain gradually transformed these bodies of water into farmland. While this phenomenon of polder field agriculture served to mitigate droughts and enhance stable crop yields in the agricultural society, excessive development led to the uncontrolled expansion of polder fields, inevitably resulting in corresponding environmental issues. As lake areas diminished, the lakes' capacity to regulate floods decreased, and waterways became progressively obstructed. By the late Qing period, the drawbacks of this reclamation method became increasingly apparent, as the Jianghan Plain experienced frequent flooding. The floodwaters carried significant amounts of sediment, exacerbating water disasters in the lakes and resulting in the formation of extensive silted land. [349]

Although the proliferation of polder field was beneficial for land utilization and agricultural development, its excessive expansion contributed to ecological degradation, compromising flood defence capabilities. The increase in embankments correlated with intensified and more frequent flooding [350] Faced with oncoming floodwaters, the population found themselves powerless, with farmland submerged and suffering severe losses of life and property. The advantages of lake-farming increased, while the associated water disasters intensified. The struggle for land between humans and water, driven by self-interest, inevitably leads to water contesting land, resulting in disasters.

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[349] 张正明，刘玉堂，*《湖北通史-明清卷》*，（武汉：华中师范大学出版社，1999），页：234. / Zhengming Zhang, Yutang Liu, *General History of Hubei: The Ming and Qing Dynasty Volume,* (Wuhan: Central China Normal University Press, 1999), p. 234.

[350] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 416-417. / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), pp. 416-417.

The populace has endured significant suffering. However, it is undeniable that the development of terrace farming during the Ming and Qing dynasties has had a lasting impact on the agricultural production patterns and the natural environment of the Jianghan Plain region.

Environmental changes are influenced by both natural and social conditions, leading to a gradual replacement of paddy fields due to shifts in modern agricultural practices. Currently, the area of polder fields in the Jianghan Plain is continuously decreasing, with some paddy fields having already been or set to be converted into urban and industrial land. This transformation has resulted in the regional characteristics and uniqueness of polder field agriculture in the Jianghan Plain becoming increasingly blurred and diminished. The subsystems within the paddy field landscape interact with one another, and the shift in production methods has led to significant changes across these systems. Although the regional features of the polder field landscape are being erased, key landscape elements such as lakes, rivers, ponds, irrigation channels, shelterbelts, roads, vegetable plots and village platforms serve as the main carriers of this regional landscape transformation. These historical landscape elements, originating from the Ming and Qing Dynasties, must be reflected in the efforts to protect and sustain the regional landscape of the Jianghan Plain.

Rural Villages and Urban Towns

Since the early Ming Dynasty, a government-directed migration movement has facilitated the settlement of numerous immigrants from Jiangxi and Anhui in the Jianghan Plain. This influx of migrants has resulted in significant and sustained changes to the landscape of the region. During the Ming and Qing Dynasties, repeated waves of

population migration led to a dramatic increase in the population, which in turn resulted in a rise in the number of villages. The local inhabitants adopted intensive land-use practices that capitalized on high-value crops, introducing new agricultural products that enabled farmers to establish a stable presence in the Jianghan Plain. While individual villages may have maintained traditional settlement forms, the increasing population necessitated the establishment of new villages, progressively altering the overall landscape characteristics of the rural areas. [351]

During the Ming and Qing dynasties, the development of the commodity economy progressed gradually from the lower reaches to the middle reaches of the Yangtze River. The Jianghan Plain, with its abundant paddy field agriculture and favourable geographic conditions, emerged as one of the key trade hubs in China at that time.[352] As the economy evolved, urban development in the Jianghan Plain entered a new phase. In the Ming and Qing periods, the settlements in this region began to exhibit two distinct patterns: urban settlements and rural settlements. [353]

Construction patterns

In the central region of the Jianghan Plain, numerous elevated terraces can be found that are slightly higher than the surrounding landscape. Due to the frequent flooding that affects this plain, residents are compelled to establish their homes on these naturally elevated landforms or on artificially constructed platforms to ensure more stable living

[351] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 194. / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Social Sciences Academic Press (China), 2023), p. 194.

[352] 王蕾，<明清时期江汉平原水患与城镇发展>，*《中南民族大学学报（人文社会科学版）》*，2（2000），页 71-74. / Lei Wang, 'Flooding and Urban Development in the Jianghan Plain during the Ming and Qing Dynasties', *Journal of South-Central Minzu University (Humanities anf Social Sciences)*, 2 (2000), pp. 71-74.

[353] 荣蓉，<江汉平原南部居民与聚落研究>，（硕士论文：华中科技大学，2010），页 20. / Rong Rong, 'Study of Residents and Settlements in Southern Jianghan Plain', (Master Thesis: Huazhong University of Science and Technology, 2010), p. 20.

conditions. Field investigations revealed that these terraces typically rise between 1 to 3 metres above the surrounding ground, with few measuring less than 1 metre or exceeding 3 metres. Some terraces have been formed by the natural accumulation of soil or the modification of existing mounds, while the majority are artificially constructed. The artificially built platforms are often located near personal farmland and on sites with naturally slightly higher terrain. Typically, inhabitants first excavate soil to construct these platforms, which are then compacted before the construction of residential buildings on their surfaces. Observations from multiple villages during field research indicated a common trend: the area of the platforms occupied by each household in the Jianghan Plain generally exceeds 100 square metres.

During the Ming and Qing dynasties, a period characterized by the absence of modern industrial civilization, the construction of large platforms was a formidable task that necessitated collaborative efforts among numerous individuals. Under favourable geographical conditions, local residents may have continued to build around the already established foundations, thereby increasing the area of these platforms to accommodate new housing. However, field surveys reveal that instances of multiple households sharing a single platform were quite rare. Insights gathered from local villagers, coupled with an examination of historical records, indicate that in the collective consciousness of the inhabitants of the Jianghan Plain, both the platform and the structures built upon it are considered private property. Even among family members, once children reach adulthood, they typically aspire to possess their own complete dwelling (including both the house and the platform) rather than constructing a house on an extended portion of their parents' platform.[354] Consequently, the construction of new residential buildings generally entails the creation of new platforms or the selection of new mounds, which are typically independent of one another and not interconnected. For the sake of

[354] 鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 203-204. / Xiqi Lu, *The Human-Environment Relationship and Regional Society in the Middle Reaches of the Yangtze River,* (Xiamen: Xiamen University Press, 2016), pp. 203-204.

convenience in farming rice fields or fishing, children who establish separate households often opt to build their homes in proximity to their parents' houses. This pattern of settlement serves to perpetuate and reinforce the tradition of dispersed living, while simultaneously contributing to the distinctive landscape of villages in the Jianghan Plain region.

Through a review of relevant local chronicles, it has been observed that during the Ming and Qing dynasties, many place names in the central region of the Jianghan Plain were designated with the characters '台' (Tai) or '墩' (Dun). Most of these village names have been retained to the present day. These natural villages are relatively small in scale and typically combine a surname with '台' or '墩' to form the village name, such as in the case of Xiongjiatai (熊家台), which indicates that these villages have been established on natural terraces or artificial mounds within the Jianghan Plain since their recorded inception, continuing to the present day.

In the frequently flood-prone plain lake areas, the practice of constructing homes on elevated ground or platforms above the surrounding terrain reflects an inherent inclination among the inhabitants. This method has been employed by humans living in the Jianghan Plain since the Neolithic period, a conclusion that was reached in Chapter Three of this thesis.

During the Ming and Qing dynasties, the village architecture in the Jianghan Plain was characterized not only by its construction on elevated platforms but also by its pattern of habitation along embankments. The map of Mianyang map during the Republican period distinctly illustrates a typical distribution pattern characterized by construction along embankments (Figure 160). As depicted in this map, it is evident that all settlements within the region are situated adjacent to the dike fields and are not

constructed in the interior of the dyke fields themselves.

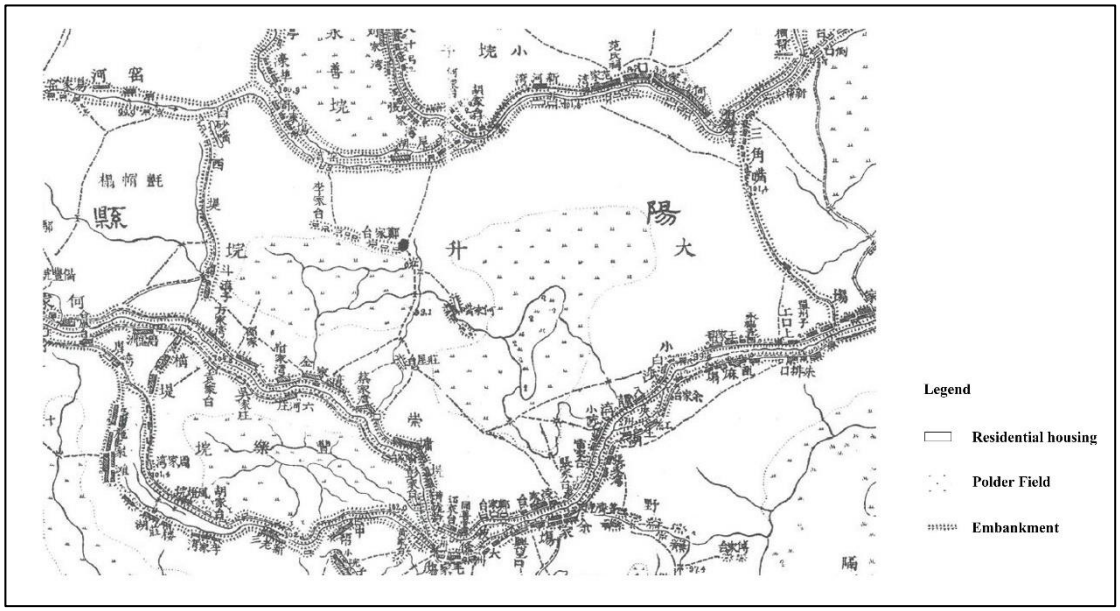


Figure 160. Map of natural settlements in the Shahu region of eastern Mianyang during the Republican era. (Source: recreated by the author, based on the '鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 206. / Xiqi Lu, *The Human-Environment Relationship and Regional Society in the Middle Reaches of the Yangtze River*, (Xiamen: Xiamen University Press, 2016), p. 206.')



Figure 161. Aerial photograph of the polder field in the Jianghan Plain. (Source: captured by the author)

Field investigations reveal that many villages in the heart of the Jianghan Plain are situated along riverbanks. In these villages, some houses are constructed directly on the embankments, while the majority are aligned parallel to them, typically positioned behind the embankments, only a few scattered temporary structures have been erected in the interior of the polder fields, serving the purpose of providing farmers with a place to rest temporarily and store agricultural tools (Figure 161). The foundations of these houses may either integrate with the embankments, creating a protruding form toward the inner side of the embankment, or may be

separated from the embankments, often connected by wooden boards. This arrangement results in a linear distribution of houses and their foundations along the embankments, gradually forming larger settlements.

The embankments typically serve as boundaries between different villages, with the development of the villages evolving in accordance with the shape of the embankments, which may take various forms, including linear and circular patterns (Figure 162). This pattern of settlement distribution can be attributed to two primary factors: the increasing population during this period, which created land shortages, and the necessity for efficient agricultural management. [355]



Figure 162. Two patterns of settlement distribution. (Source: based by the Google Earth)

Due to the constraints of limited land available for construction and the economic capabilities of households, rural residences in the central region of the Jianghan Plain during the Ming and Qing dynasties were initially characterized by simplicity. These homes typically employed the most straightforward and economical designs, consolidating living quarters and structures for storing personal belongings, including livestock and agricultural tools, under a single roof (Figure 163). Even today, many

[355] 汪峰，<长江中游人居景观研究-脉络梳理及可持续发展之路的探索>，（博士论文：重庆大学，2010），页 42. / Feng Wang, 'Study on Human Settlements Landscape in Middle Reaches of Yangtze River – Cultural Heritage Context and Sustainable Development', (Doctoral Thesis, Chongqing University, 2010), p. 42.

such simple structures can be observed throughout the plains.



Figure 163. A remnant of a Qing Dynasty residential structure in the Jianghan Plain. (Source: captured by the author)



Figure 164. Aerial imagery of rural residential structures in the Jianghan Plain. (Source: captured by the author)

Typically, these residences consist of one well-lit room and two darker rooms, with some buildings even incorporating a cattle shed or a pigpen. The roofs of these structures are covered with thatch or tiles, and the eaves extend outward to provide protection from rain. The walls are constructed with a wooden framework, primarily using rammed earth, with bricks employed only at door and window frames and corners. Generally, there is a small courtyard in front or behind the house, where residents often cultivate fruit trees and may store fertilizer and some agricultural tools (Figure 164).

Currently, a walk along the levees of the Jianghan Plain reveals numerous residential structures that have developed into elongated villages. Many of these villages feature densely packed houses, forming cohesive settlements complete with streets parallel to the levees. Over time, larger villages may have evolved into more substantial towns

through prolonged development.[356] Within these elongated villages or compact towns, it is likely that spaces are retained between different clusters of houses, which are often utilized for planting vegetables or rice. Within each cluster, some houses exhibit relative looseness with noticeable gaps, while others are positioned almost without any separation. This chapter argues that during the Ming and Qing dynasties, houses or groups of houses were likely dispersed, exhibiting a scattered distribution. As the population continued to grow, new houses were constructed, eventually leading to their amalgamation. The dispersed layout is probably reflective of the original configuration of most settlements in the Jianghan Plain, while the aggregated elongated villages or compact towns represent a later phase of development.

In summary, the selection of settlement sites in the Jianghan Plain during the Ming and Qing dynasties prioritized locations on natural earthen mounds or artificially constructed platforms that were slightly elevated, in order to avoid flood incursions. Initially, the inhabitants of the plain relied on the natural levees along rivers such as the Yangtze and Han, as well as the surrounding natural high grounds, as their criteria for site selection. However, as the development of the Jianghan Plain progressed and more people settled in areas devoid of natural high ground, there arose a necessity to leverage collective efforts. Through cooperation, these communities constructed elevated platforms to establish their residences. Many of the platforms in the plain were built in alignment with existing levees, with some even connected to them, thereby creating a settlement pattern where local residents lived on elevated ground adjacent to the levees.

[356] 鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 211. / Xiqi Lu, *The Human-Environment Relationship and Regional Society in the Middle Reaches of the Yangtze River,* (Xiamen: Xiamen University Press, 2016), p. 211.

Rural settlement morphology

In this chapter, the term 'rural settlement morphology' refers to the spatial distribution pattern of rural settlements in the Jianghan Plain region. Generally speaking, the morphology of rural settlements can be categorized into two types: dispersed and clustered. [357] In the settlement studies of the Jianghan Plain, rural settlement forms primarily manifest in two models: dispersed and clustered. The fundamental difference between these two types is not merely based on population size or land area but is instead reflected in the spatial relationship between residential areas and productive spaces (such as farmland, lakes, and forests). Clustered settlements are characterized by dense buildings with residential areas separated from agricultural lands, while dispersed settlements are typified by scattered farmhouses closely integrated with cultivated land and water bodies.

Field surveys indicate that the settlement morphology in the central Jianghan Plain exhibits significant spatial complexity, with many villages having a history traceable to the Ming and Qing dynasties. Some large villages, which appear to be clustered, are actually composed of multiple independent scattered settlements, such as Zhangxiwan (张西湾) Village in Huangpi District. In contrast, micro-villages with populations ranging from a few to several dozen households are widely distributed in the reclaimed land areas (known as polder field) and are typically located on higher mounds or raised platforms to avoid flood risks (Figure 165). Through field research and comparison with remote sensing satellite imagery, the distribution of dispersed villages can be classified into three types: 1) Edge-type low mountain hills (higher elevation, less flood risk); 2) Lakeside-type (convenient access to water, most common); 3) Riverbank embankment-type (requires embankment construction for flood protection, typically

[357] 鲁西奇，*《长江中游的人地关系与地域社会》*，（厦门：厦门大学出版社，2016），页 189. / Xiqi Lu, *The Human-Environment Relationship and Regional Society in the Middle Reaches of the Yangtze River,* (Xiamen: Xiamen University Press, 2016), p. 189.

linear in layout) (Figure 166).



Figure 165. Satellite imagery of rural settlement distribution in the Jianghan Plain. (Source: created by the author, based on the Google Earth)



Figure 166. Satellite imagery of rural settlements along the banks of the Yangtze River. (Source: created by the author, based on the Google Earth）

The formation mechanism of dispersed settlements is rooted in both natural and social factors. From a natural perspective, the low-lying and flood-prone topography of the Jianghan Plain forces residents to settle on higher ground, while abundant natural resources support the dispersed layout of the population. From a socio-economic

perspective, the technological limitations of platform construction during the Ming and Qing periods enhanced the residents' demand for independent property rights. The dispersed settlement pattern facilitated proximity to farmland, reduced collective constraints, and clarified land ownership.

Moreover, due to the frequent occurrence of floods in the Jianghan Plain, farming, especially rice cultivation, is labour-intensive. The unique structure of the reclaimed land area results in numerous muddy rural paths and field embankments. These factors collectively encourage people to build their homes as close as possible to their cultivated fields and fishing areas in rivers and lakes. To facilitate irrigation, dispersed villages often adopt a construction pattern with embankments surrounding fields, with residences mainly located within the reclaimed land. Therefore, the economic demands of farming have also been a significant factor driving the development of this dispersed settlement pattern.

It is important to note that the settlement morphology in the Jianghan Plain is not a static opposition between two models. Under the influence of religious and cultural factors or family-based population growth, villages often adopt a clustered settlement model, resulting in larger aggregated villages. These settlements are frequently named after family surnames, such as Dayuwan Village in Huangpi. This dynamic evolution suggests that the two forms—dispersed and clustered—can transform into one another under the influence of factors such as population growth and cultural dissemination, collectively contributing to the regional diversity of settlement landscapes.

Dayuwan village

Huangpi County, situated on the periphery of the Jianghan Plain, is home to a clustered settlement. According to the *Genealogy of the Yu family (《余氏宗谱》)*, the history of this village can be traced back to the second year of the Hongwu era of the Ming Dynasty (1369 AD). The earliest inhabitants migrated from Jiangxi Province and established their residence here, forming a community of approximately one hundred households. Given that the majority of the residents belong to the Yu family lineage, the village is named Dayuwan (大余湾) (Figure 167). Huangpi County is located in the northeastern part of Hubei Province and shares a border with Wuhan, the provincial capital to the south. Due to the turmoil of war, the population in this region was scarce during the early Ming period. However, following a period of relative stability, a significant influx of migrants from Jiangxi occurred, leading to a gradual increase in the local population.



Figure 167. Aerial photography of specific areas within Dayuwan Village. (Source: captured by the author)

Due to its location on the periphery of the Jianghan Plain, Dayuwan Village is characterized by an intricate interplay of plains and hills, surrounded by mountains and endowed with fertile land (Figure 168). The Sheshui Lake (滠水湖) flows to the west of the village, which features numerous ponds scattered throughout. A main street runs from east to west, contributing to the village's overall linear form, effectively connecting the four groups within the settlement (Figure 169). The network of alleys and paths connects to the main street, while the buildings are predominantly situated on one side of the river. This architectural layout exemplifies the typical terraced enclosure

style found in the Jianghan Plain.



Figure 168. The natural environment surrounding Dayuwan Village. (Source: captured by the author)

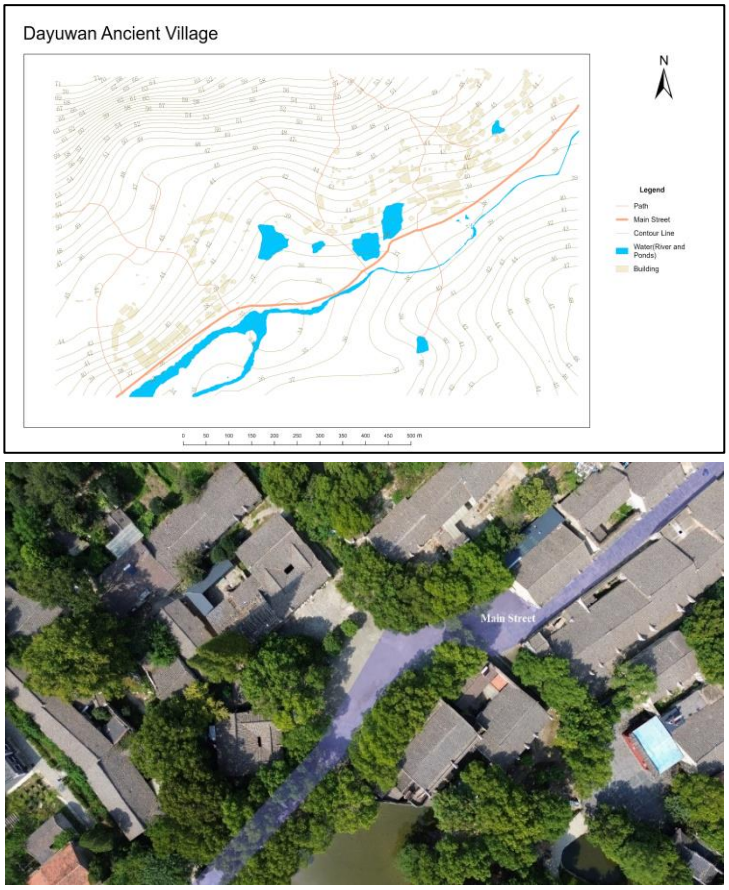


Figure 169. The GIS map of Dayuwan Village and the aerial imagery illustrating the main street of Dayuwan Village. (Source: created and captured by the author use ArcGIS Pro and Drone)

It is noteworthy that, due to the village's location on the edge of the Jianghan Plain, in proximity to hilly terrain, the local inhabitants have constructed terraced fields along the contour lines in addition to the traditional polder fields characteristic of the Jianghan Plain (Figure 170). This terraced landscape distinguishes Dayuwan Village from the majority of other villages in the Jianghan Plain.



Figure 170. The terraced landscape within Dayuwan Village. (Source: captured by the author)

The selection of Dayuwan Village as a case study for research on agglomerated settlements in the Jianghan Plain is based on its unique and representative historical background, spatial form, geographical location, and cultural heritage. These characteristics distinctly contrast it with dispersed settlements, collectively shedding light on the internal logic behind the evolution of regional settlement patterns. The origins of Dayuwan Village can be traced back to the migration of Jiangxi immigrants during the second year of the Hongwu period of the Ming Dynasty and the lineage development within the clan system. This history not only reflects the formation characteristics of family-dominated settlements in the region but also provides a valuable historical sample for the study of population migration and settlement development. Its linear main street connects various residential clusters, and the terraced building layout encapsulates the morphological features of agglomerated settlements in the Jianghan Plain, forming a stark spatial contrast with the scattered layouts of dispersed settlements. Geographically, Dayuwan Village is situated at the transition zone between the plains and the hills, where both embanked fields and terraced fields coexist within a complex agricultural landscape. This setting demonstrates the settlement-building wisdom of human adaptation to intricate topography and stands in sharp contrast to the dispersed settlement logic, where higher

ground is chosen for flood prevention and fields are scattered for agricultural purposes. Additionally, the clan system and architectural techniques, shaped by the interplay of immigrant culture and the local environment, not only provide empirical material for exploring the influence of social and cultural factors on settlement forms but also highlight significant differences in function and culture when compared to the residential patterns of dispersed settlements, which are influenced by resource dispersion and independent land ownership. The multidimensional relationships between agglomerated and dispersed settlements in terms of spatial distribution, formation mechanisms, and functional landscapes effectively address the limitations of regional research focused primarily on dispersed settlements. This research further refines the framework for understanding the diversity of settlement forms and their dynamic evolution processes in the Jianghan Plain.

Town settlement morphology

During the Ming and Qing periods, there was a significant expansion of markets, which coincided with the large-scale development of paddy fields in the Jianghan Plain. This development enabled many migrants to acquire land and settle in the region permanently. The emergence of numerous markets within villages fostered the growth of a commodity economy, giving rise to a settlement pattern distinct from those of previous historical dynasties: the market town settlement form. This form is characterized by a village market that primarily engages in the exchange of agricultural products, and the subsequent settlement structure that evolved from these village markets. [358]

[358] 荣蓉，<江汉平原南部居民与聚落研究>，（硕士论文：华中科技大学，2010），页 23-27 / Rong Rong, 'Study of Residents and Settlements in Southern Jianghan Plain', (Master Thesis: Huazhong University of Science and Technology, 2010), pp. 23-27.

From the early Ming Dynasty, the development of the polder field economy marked the beginning of a significant period of expansion in the Jianghan Plain. During this time, the Jianghan Plain emerged as one of the primary production bases for both staple food crops and cash crops in Hubei Province and throughout China. The social division of labour expanded considerably; in addition to the agrarian population, there was a continuous increase in the number of individuals engaged in commerce and industry. This diversification laid a foundation for urban development, resulting in a steady increase in the number of towns. The region's favourable water transport conditions and advantageous geographic location contributed to its role as a densely populated area for the formation and development of village markets and town centres.

Although town settlements and traditional rural settlements share certain spatial characteristics, their fundamental settlement patterns differ significantly. The most core distinction lies in the spatial organization, where town settlements are typically centred around commercial markets, whereas village settlements predominantly revolve around the agricultural field system. Towns largely develop from early rural settlements, and the emergence of these towns serves to provide a common marketplace for surrounding villages.[359]

Towns are often located at crossroads or at the entrances of river valleys, usually situated at the junction of two or more distinct production areas. Their existence facilitates connections among the markets of neighbouring villages, thereby promoting commercial trade. As a settlement form, towns have emerged, with numerous rural markets transitioning toward small towns. If such small towns continue to develop and

[359] 荣蓉，<江汉平原南部居民与聚落研究>，（硕士论文：华中科技大学，2010），页 24 / Rong Rong, 'Study of Residents and Settlements in Southern Jianghan Plain', (Master Thesis: Huazhong University of Science and Technology, 2010), pp. 24.

expand, they may gradually evolve into urban centres.

The *Hubei Gazetteer (《湖北通志》)* compiled during the Jiaqing period of the Qing Dynasty (1796-1820 AD), contains records indicating that:

> The Hubei region connects seven areas and is bordered by the Yangtze River and the Han River, earning the designation of a water-rich and marshy land. Most of the population resides near water bodies, utilizing the convenience of boats to engage in commerce and acquire wealth. [360]



Figure 171. Location map of Chengji Ancient Town. (Source: created by the author, based on the Google Earth)

This excerpt illustrates that during the Qing Dynasty, the Jianghan region primarily relied on waterway transportation, with residents leveraging the advantages of these routes for commercial exchanges.

Towns in the Jianghan Plain are predominantly located along the banks of rivers, particularly the Yangtze River and the Han River, as well as at the confluence of several waterways. An example is Chengji Ancient Town, which was established during the Song Dynasty and developed during the Ming and Qing Dynasties. Situated in the heart of the Jianghan Plain, Chengji Ancient Town benefits from the advantageous geographical position created by the flow of the Chengjiaji River,[361] which surrounds the town from the south to the north, facilitating both water and land transportation. Chengji Ancient Town is bordered by Jiangling County to the west, Wangqiao Town to

[360] 吴熊光，白龄，陈诗，张承宠（清），《*湖北通志*》/ Xiongguang Wu, Ling Bai, Shi Chen, Chengchong Zhang, (Qing Dynasty), *Hubei Gazetteer.*

[361] The Chengjiajie River is one of the tributaries of the Yangtze River.

the north, and Xiaohekou Town in Shishou City to the south, serving as a central hub for the distribution of goods from various regions during that time (Figure 171). Due to its unique geographical location, Chengji Ancient Town experienced significant economic prosperity during the Ming and Qing Dynasties, establishing itself as one of the important towns in the Jianghan Plain during that period.

In plain lake regions where waterway transport is predominant, nearly all towns are situated along the banks of rivers. In such contexts, the morphology of these towns is naturally influenced by the river. As towns need to connect with surrounding markets, their development tends to extend along the riverbanks, reflecting the demands of commercial growth.

The Jianghan Plain in Hubei Province contains several historical townsite relics of significant value. Among them, the Chengji Ancient Town (程集古镇) in Jianli City and the Keli Ancient Town (珂里古镇) in Honghu City are both designated as cultural heritage protection areas. In 2007, Chengji Ancient Town was recognized by the Ministry of Housing and Urban-Rural Development of the People's Republic of China and National Cultural Heritage Administration as one of China's third batch of Historical and Cultural Towns. [362] Its existing architectural ensemble from the Ming and Qing dynasties stretches along the Old Changhe River, forming a linear spatial pattern characterized by the 'parallel alignment of river and street', highlighting the typical features of 'water-based construction and market development'. Keli Village, where Keli Ancient Town is located, was included in the fifth batch of China's

[362] Department of Housing and Urban-Rural Development of Hubei Province, 'List of Historically and Culturally Significant Towns and Villages in China (Hubei Province)', *Department of Housing and Urban-Rural Development of Hubei Province Website*, 2019.
< https://zjt.hubei.gov.cn/bmdt/gxhyylm/jxry/lswhmz/201910/t20191028_77090.shtml > [accessed 10 May 2024].

Traditional Villages list in 2018. [363] Historically, its prosperity was attributed to its proximity to a tributary of the Yangtze River and its reliance on water transport. The traditional buildings that remain are distributed in a linear or cluster arrangement along the riverbank, demonstrating the spatial characteristics of a water-based settlement.

From the perspective of regional settlement spatial morphology, high-resolution satellite imagery can be incorporated into geographic information analysis platforms such as AI EARTH, combined with building extraction techniques, to analyse the spatial relationship patterns between settlements and water systems. Based on the geographical features of the Jianghan Plain, which is characterized by a dense water network and numerous ports and creeks, the layout of settlements can generally be classified into two types: one where buildings extend along a single side of the water body, with the market area concentrated along the riverbank, integrating transportation and flood control functions through docks and embankments (Figure 172); and another where buildings develop on both sides of the water, connected by bridges and ferries, forming a composite spatial structure (Figure 173).

[363] Department of Housing and Urban-Rural Development of Hubei Province, 'The Fifth Batch of Traditional Chinese Villages List (Hubei)', *Department of Housing and Urban-Rural Development of Hubei Province Website*, 2019.
< https://zjt.hubei.gov.cn/bmdt/gxhyylm/jxry/zgctcl/201910/t20191028_77095.shtml > [accessed 10 May 2024].



Figure 172. Distribution pattern of buildings along the water body. (Source: created by the author, use ArcGIS Pro)



Figure 173. Distribution patterns of buildings along both sides of the water body. (Source: created by the author, use ArcGIS Pro)

Field research conducted at Chengji Ancient Town and Keli Ancient Town reveals that the arrangement of houses in these settlements generally follows a certain order. In Chengji Ancient Town, houses are regularly distributed along the main street on one side of the Old Changhe River, forming a continuous facade that aligns with the

commercial-residential pattern typical of the Ming and Qing periods, where the market is situated in front of the residential areas. In contrast, the traditional buildings in Keli Ancient Town are arranged linearly or in clusters along the riverbank. Some dwellings are built adjacent to one another, depending on the water, and although the layout appears more flexible than that of Chengji Ancient Town, it still reflects the inherent spatial logic organized around the water system. Both settlements demonstrate a historical continuity in their architectural arrangement compared to contemporary rural townships.

Field research conducted on the remnants of these town settlements revealed that the arrangement of houses in town clusters generally exhibits a certain degree of regularity. Houses are systematically distributed along both sides of the main street, with buildings typically situated in close proximity to one another, reflecting a layout consistent with contemporary rural town architecture. In contrast, the distribution of houses in rural settlements tends to be relatively random. Individual residences are clustered in small groups on terraces or embankments, with agricultural fields interspersed throughout the settlement, blurring the delineation between internal space and the external environment. While the public spaces in rural settlements exhibit a strong centripetal tendency toward the settlement centre or ancestral halls, the public spaces in town clusters are comparatively ambiguous, lacking a defined central public area. Often, temples or ancestral halls are constructed at the ends of the main street rather than at a central focal point.

Based on the research findings, it is evident that both village markets and townships in the Jianghan Plain region are predominantly situated near water bodies. This phenomenon can be attributed to two main factors. First, during the initial phase of immigration into the Jianghan Plain, settlers opted to establish their new settlements adjacent to water sources. The markets that subsequently emerged and flourished

naturally developed along these water bodies. Second, the region is characterized by an abundance of rivers, and compared to the relatively underdeveloped land transportation network, waterway transportation has been significantly more advanced. It is reasonable to conclude that the establishment and growth of markets and townships along rivers was a strategic choice to facilitate the efficient transportation of goods.

Conclusion

In summary, this chapter employs historical literature research to analyse population mobility in the Jianghan Plain during the Ming and Qing dynasties. The influx of a large population led to significant changes in agricultural landscapes, which are examined in detail concerning the development of polder fields during this period. The chapter integrates historical literature with Geographic Information Systems (GIS) to analyse rural and urban settlement patterns. This is complemented by field investigations that assess the arrangement of settlement architecture. Together, these sources contribute to a hypothesis regarding the landscape development of the Jianghan Plain during the Ming and Qing periods. The abundance of historical documents and nearly complete historical architectural remains from this era, combined with comprehensive field data, significantly enhances the accuracy of the landscape analysis for this period.

In terms of agriculture, prior to the Ming and Qing Dynasties, the level of development in the Jianghan Plain was relatively low, with some areas remaining inadequately developed and many regions characterized by seasonal floodplains. The limited population and relatively primitive agricultural techniques constrained the exploitation and utilization of land. However, during the Ming and Qing periods, a major phase of development commenced. With a more stable society and a significant influx of immigrants into the Jianghan Plain, the population continued to rise. To meet the growing demand for food, large-scale land reclamation efforts began. This involved, on

one hand, the reclamation of wasteland on the plain to expand the cultivated area, and on the other hand, the transformation of lakes and marshes into farmland through methods such as lake enclosure. For instance, many lake and shoal areas were enclosed, creating numerous polder fields and establishing the Jianghan Plain as a significant agricultural production region. These polder fields varied in shape and size, contributing to the distinctive agricultural landscape of the Jianghan Plain. Additionally, due to the low-lying topography of the Jianghan Plain, which is prone to water-related disasters, extensive water conservancy projects were undertaken, including the construction of embankments, excavation of ditches, and installation of sluice gates. These hydraulic works mitigated the impact of floods on agricultural production to some extent but also altered the hydrological characteristics and distribution of waterways. For example, the narrowing of river channels due to water conservancy projects increased the speed of water flow and intensified riverbank erosion. Concurrently, the growing population and agricultural demands led to continued lake reclamation, resulting in a reduction in lake areas and the destruction of wetland ecosystems. Many lakes were segmented by embankments, reducing their flood storage capacity, which, in extreme cases, exacerbated flood disasters. Consequently, despite the Jianghan Plain's capacity to provide substantial amounts of grain for the country, excessive development led to environmental degradation, which caused several significant flood events in the subsequent decades and even centuries.

Under the influence of agricultural and hydraulic developments, changes have occurred in the distribution, morphology, and construction patterns of settlements. In terms of distribution, on one hand, the development of polder fields and hydraulic engineering has led to a preference for settlement locations near water sources, elevated terrains, and areas with reliable hydraulic infrastructure. Settlements have become more prominently distributed along rivers, lakes, and embankments. Agricultural expansion has converted vast areas into farmland, with the landscape of cultivated fields on plains becoming a significant component of the settlement landscape. The ubiquitous rice

paddies and wheat fields contribute to a distinctive rural scenery. To facilitate irrigation and management of farmland, people have constructed a network of field ridges and ditches, which have also become unique elements of the settlement landscape. On the other hand, regions that were previously sparsely populated due to frequent flooding have gradually seen an increase in residents as hydraulic conditions have improved, leading to an expanded range of settlement distribution. In terms of morphology, settlements have evolved from dispersed small villages into larger residential communities and market towns. In densely populated and economically developed areas, larger market towns have emerged as commercial centres. Regarding construction patterns, during the Ming and Qing dynasties, settlement construction increasingly emphasized regularity and planning. With population growth and societal development, there has been a greater focus on the orderly layout of settlements, with more organized street and housing arrangements and clearer functional zoning.

Overall, both the terraced field landscapes and the various settlement forms within the region serve as historical witnesses, documenting the process of landscape development and transformation during the Ming and Qing dynasties. Additionally, their existence has laid the groundwork for the formation and development of the cultural landscape in the Jianghan Plain region from the modern era to the present.

Chapter 7. Modern and Contemporary Period (1840-1949) - Influence of Industrialization and Urbanization

Introduction

Beginning in the mid-nineteenth century, Western cultural influences began to permeate China, exhibiting unprecedented breadth and depth. To this day, the impact of foreign cultures has not only enriched Chinese culture but has also enhanced the country's landscapes. However, at no point have these external cultural influences been sufficiently powerful to distort the fundamental forms of Chinese culture or to alter the trajectory of its cultural development. [364]

During the period from 1840 to 1949, the introduction of Western commerce and industry into China emerged as a significant new force. In the Jianghan Plain, which had exhibited a relatively stable style, most rural areas continued to maintain the traditional patterns of settlement. However, key cities, particularly Wuhan, began to undergo transformations during this time. The expansion of large factories and urban trading ports styled after Western models marked a notable shift. Consequently, large industrial buildings, docks, and Western-style architecture became new elements of the landscape in the Jianghan Plain region.

The Early Factory

During the late Qing Dynasty, in response to the military threats posed by Western

[364] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 194 / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 194.

nations, the Qing government was compelled to establish modern arsenals. To support this military industrialization, it was essential to first expand the foundational industries. In 1890,[365] Zhang Zhidong, then Governor-General of Hubei and Hunan, selected a site near the Han River at the base of Guishan Mountain in Wuhan to construct the Hanyang Ironworks, which was completed three years later. This facility marked the first true factory in the Jianghan Plain and represented China's first large-scale modern enterprise that integrated iron mining, coal extraction, iron and steel production, rolling mill operations and armaments manufacturing.[366] The primary purpose of the ironworks was to provide raw materials for subsequent arsenals and to manufacture railway tracks for the main railway line connecting Beijing and Wuhan.[367]

The Hanyang Ironworks consists of ten main facilities, which include six large plants: the pig iron smelting plant, the wrought iron smelting plant, the converter steelmaking plant, the open-hearth steelmaking plant, the rail manufacturing plant and the foundry for iron goods. Additionally, it encompasses four smaller plants: the machinery factory, the foundry, the blacksmith shop, the fish hook and nail factory.[368] In the late 19th century, Charles, the American consul in Hankou, expressed his astonishment after visiting the Hanyang Ironworks, stating:

> Looking down from a high vantage point is exhilarating and terrifying; this place is not much different from the heartland of American manufacturing. The chimneys tower skyward, piercing the clouds, while numerous rooftops crisscross the expansive landscape. The iron smelting furnaces stand

[365] 武汉市汉阳区地方志编撰委员会,<近代工业遗址-汉阳铁厂>,*《汉阳区志》, 2007* / Compilation Committee of Local Chronicles of Hanyang District, Wuhan, 'Modern Industrial Heritage - Hanyang Ironworks', *Annals of Hanyang District,* 2007.

[366] Hanyang Zhiyin, 'Hanyang, response 1890', *Official Website of Wuhan Hanyang District People's Government*, 2021. < https://www.hanyang.gov.cn/mlhy/lsyg/202101/t20210120_1603668.html> [accessed 15 July 2023].

[367] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 233-234. / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 233-234.

[368] Dongping Fang, 'Hanyang Ironworks', *Concise Annals of Hanyang District*, 2008.
< http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1095/category_id/418757.html > [accessed 11 April 2023].

majestically, the rail rolling mill exudes solemnity and strength, and the thunderous roar of steam resonates throughout the scene... (Figure 174) [369]



Figure 174. Photograph of the Hanyang Ironworks, 1906. (Source: Changjiang Daily, 'Visiting this photography exhibition evokes a century's worth of memories of urban life in Hanyang', *Official Website of Wuhan Municipal People's Government*, 2023.
<https://www.wuhan.gov.cn/zjwh/whrw/202305/t20230526_2206378.shtml> [accessed 17 July 2023].)

This facility is a modern factory, characterized by numerous tall smokestacks positioned above its expansive workshops, creating a striking contrast with the traditional residential areas located on the opposite bank of the Han River (Figure 175). The equipment within the ironworks was sourced from the United Kingdom, Belgium and Germany. At the time of its establishment, the factory employed 3,450 workers, including 40 foreign technicians. In 1892, the Qing government dispatched ten artisans to Belgium to study smelting techniques. [370]

[369] Hanyang Zhiyin, 'Hanyang, response 1890', *Official Website of Wuhan Hanyang District People's Government*, 2021. < https://www.hanyang.gov.cn/mlhy/lsyg/202101/t20210120_1603668.html> [accessed 15 July 2023].

[370] Dongping Fang, 'Hanyang Ironworks', *Concise Annals of Hanyang District*, 2008.
< http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1095/category_id/418757.html > [accessed 11 April 2023].

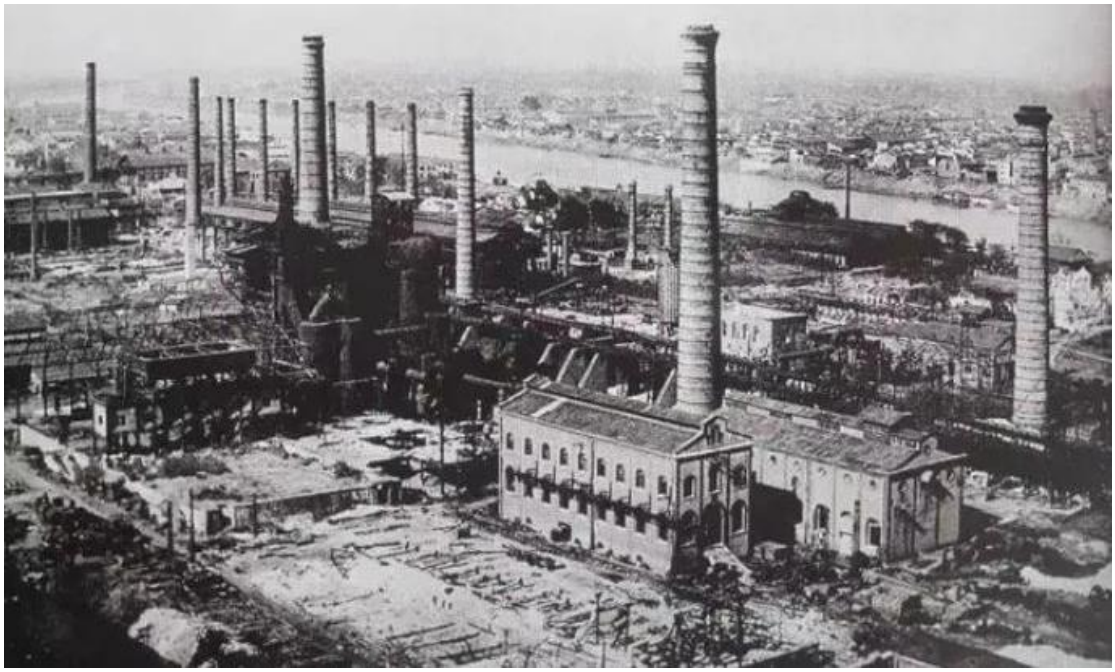


Figure 175. Photograph of the Hanyang Ironworks, 1906. (Source: Xinhua News Agency, ‘Over a century later, this area remains filled with ‘treasures’’, *New media of Xinhua News Agency*, 2021. <https://baijiahao.baidu.com/s?id=1717906704004624998&wfr=spider&for=pc> [accessed 18 July 2023].)

From this point onward, a new modern industrial landscape began to emerge in the Jianghan Plain. The introduction of new industries brought about notable visual changes to the region due to their scale. With the influx of numerous industrial machines, factories were able to operate continuously, resulting in brightly lit buildings at night. This illumination transformed the urban landscape of the time, creating a new visual form that became a focal point for onlookers and an exhilarating sensory experience. Although early factories primarily emerged in large cities such as Wuhan during the late Qing Dynasty, their limited numbers were insufficient to significantly alter the overall landscape of the Jianghan Plain. Nonetheless, this change set the stage for the future development of the region's landscape.

Shortly after the ironworks commenced operations, several modern industrial facilities began to be constructed and put into operation adjacent to the Hanyang Iron Works. These included the Hanyang Arsenal, Hanyang Powder Factory, Hanyang Nail Factory

and the Hanyang Official Brick Factory among others. These establishments represent some of the earliest examples of modern industrial facilities in China. Stretching over ten miles, they collectively form a magnificent ‘industrial corridor’ that establishes a new landscape model on the Jianghan Plain.

Marking the original sites of these factories on a map reveals that they were all constructed near the Han River. This proximity is significant, as the factories required a steady supply of raw materials while also needing efficient transportation for their products. Consequently, there was a growing demand for freight transport. During the late Qing Dynasty, water transportation dominated the logistics sector. Situating these factories alongside major rivers significantly reduced transportation costs and enhanced efficiency.

Taking the Hanyang Ironworks as an example, although the factory is located in Wuhan, the iron materials used were sourced from the Daye iron ore mines in Hubei and coal from Pingxiang in Jiangxi. Utilizing waterways for transport was undoubtedly the most convenient mode of transport during that era. Once workers transported the raw materials to the ironworks, they shipped the finished rail steel to lay down railway tracks, thereby creating a more modern transportation system. This development not only fulfilled the transportation needs associated with industrialization but also impacted the overall landscape of the region.

Unfortunately, due to the unique geographical features of the Jianghan Plain and the persistent threat of flooding, most areas within the Jianghan Plain did not develop railway transportation during modern history, with the exception of Wuhan. For an extended period, this region continued to rely on inland river transport as its primary means of logistics.

In 1938, the Japanese military launched a large-scale invasion of Wuhan. In response, the Nationalist government decided to relocate the Hanyang Iron Works entirely to

Dadukou (大渡口), Chongqing. Portions of the factory that could not be moved were destroyed by explosives, while some buildings that were not demolished in time were occupied by Japanese forces and repurposed as warehouses. Subsequently, during the civil war, the original site of the ironworks was ultimately reduced to ruins.[371] Apart from the Hanyang Iron Works, all other factories were destroyed during the Anti-Japanese War, and the once-glorious 'Ten-mile industrial corridor in Hanyang' was left in ruins.

The Hanyang Ironworks no longer exists today. During the urban demolition in 1999, the boundary marker of the former Hanyang Ironworks was excavated near its original site. Having withstood over a century of wind and rain, this marker serves as an important historical witness to the industrial development in modern Chinese history.[372]

Construction of Trade Ports

During the modern period in China, the most significant influence of Western countries on the Chinese landscape was manifested in the establishment of treaty ports.[373] Foreigners from various nations naturally congregated along rivers and coastal areas. They settled in the concession zones within these treaty ports, where, in addition to constructing docks, they built numerous residential and commercial buildings that reflected their own architectural styles.[374] At the end of the Qing Dynasty, when China opened itself to foreign trade, the clean and orderly streets and magnificent buildings constructed by Europeans in these treaty ports stood in stark contrast to the disorder,

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[371] Dongping Fang, 'Hanyang Ironworks', *Concise Annals of Hanyang District*, 2008.
< http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1095/category_id/418757.html > [accessed 11 April 2023].

[372] 武汉市汉阳区地方志编撰委员会,<近代工业遗址-汉阳铁厂>,*《汉阳区志》, 2007* / Compilation Committee of Local Chronicles of Hanyang District, Wuhan, 'Modern Industrial Heritage - Hanyang Ironworks', *Annals of Hanyang District,* 2007.

[373] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 235-240 / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 235-240.

[374] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 235-236 / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 235-236.

congestion, and noise found in the areas inhabited by the Chinese at that time.[375]

The overall development of trading ports progressed more rapidly than that of other areas within the city. One significant reason for their selection is their open and accessible location, their proximity to water systems and superior transportation conditions. Foreign merchants introduced trade within the leased concessions at these ports, and the relatively favourable security situation attracted a number of Chinese merchants to move into these areas for residence and investment. As industrial development advanced, more Chinese merchants were drawn to reside permanently in the trading ports, resulting in a rapid population increase. Although the proportion of foreigners in the total population is considerably smaller than that of Chinese individuals, the influence of Westerners on the landscape of urban trading ports is significantly greater than that of their Chinese counterparts. [376]

Shashi trade port

The Jianghan Plain, characterized by its developed water systems, featured two prominent trading ports during this period: the Shashi trading port and the Hankou trading port. Shashi Wharf boasts a rich history of nearly 3,000 years, having served as the outer port of the capital of the Chu state during the Spring and Autumn and Warring States periods.



Figure 176. A photograph of the Shashi Customs Building (left) and the Tax Commissioner ' s Office (right), showcasing traditional Chinese and Western architectural styles, taken a century ago. *(Source:* Hubei Daily, 'Photographic Retrospective of Shashi Over the Past Century', Shashi District People's Government Official Website, 2024. <http://www.shashi.gov.cn/ssqxw/ssyw/202406/t20240626_938802.shtml > [accessed 29 July 2024])

[375] P. Bure, 'Tientsin', *Societe royale Belge de geographie, Bull*, 23 (1899), p. 244.

[376] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 239. / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 239.



Figure 177. Aerial photograph of the Shashi trade port, taken in 1937. (Source: Hubei Daily, 'Photographic Retrospective of Shashi Over the Past Century', Shashi District People's Government Official Website, 2024. <http://www.shashi.gov.cn/ssqxw/ssyw/202406/t20240626_938802.shtml > [accessed 29 July 2024])

Historically, the residents of Shashi have lived in close proximity to water, which has significantly contributed to the area's prosperity. Due to its advantageous location for both water and land transportation, Shashi Wharf emerged as one of the major distribution centres for goods in the Jianghan Plain and throughout China during modern times (Figure 176). In 1876, the *Yantai Treaty* (*《中英烟台条约》*) was signed between China and Britain, designating Shashi Port as a 'depot port' for foreign vessels. In 1895, the *Treaty of Shimonoseki* (*《马关条约》*) was concluded between China and Japan, establishing Shashi, along with Chongqing, Suzhou, and Hangzhou, as one of the first four inland trading ports to open to foreign trade. Consequently, foreign merchants began to establish trading houses, docks, and residential buildings in this area (Figure 177). [377]

During World War II, the Japanese military bombed Shashi, resulting in the port city becoming nearly a wasteland, with the exception of the main structure of the Anli British Company (Arn hold Karbert & Co. Ltd), which remained intact (Figure 178). Founded in 1930, this prominent British trading firm had previously invested in several enterprises in Shashi, including the Shashi Cotton Mill and the Shashi Packing Factory. In contrast to the dual-pitched roof style of residential buildings on Daci Street from the Republic of China period, characterized by red-tiled roofs, the architecture of this trading



Figure 178. Photographs of the existing main structure of Anli British Company (Arn hold Karbert & Co. Ltd). (Source: captured by the author)

[377] Hubei Daily, 'Photographic Retrospective of Shashi Over the Past Century', Shashi District People's Government Official Website, 2024. < http://www.shashi.gov.cn/ssqxw/ssyw/202406/t20240626_938802.shtml > [accessed 29 July 2024].

firm both emotionally mimics British architectural styles and subtly incorporates local characteristics. This is evidenced by the choice of regional building materials, such as bluestone bricks, which reflect the area's unique architectural identity.

Hankou trade port

The Hankou trade port, also located in the Jianghan Plain, is not only significantly larger in area than the Shashi treaty port, but its importance is further underscored by the prominence of Wuhan, which led to Hankou gradually evolving into a concession area. This site still retains numerous historical buildings and wharves from the modern era. Together, these structures create a distinctive skyline alongside the broad, tree-lined avenues by the Yangtze River.

Wuhan has historically been a vital hub connecting nine provinces, with the origins of its thriving dock culture traceable to the Ming Dynasty. In 1474, due to the diversion of the Han River, which flowed into the Yangtze River from the northern foothills of Guishan Mountain, Hankou began to develop independently. Its favourable port conditions facilitated rapid growth, transforming it into a burgeoning commercial port with a robust trade and transportation industry. In 1858, following the Second Opium War, China and the United Kingdom signed the *Treaty of Tianjin (《中英天津条约》)*, which designated Hankou as a trading port, thereby formally opening Hankou to international commerce.[378] Subsequently, consulates were established by countries such as France, Russia, the United States, Germany, Japan and Italy along the riverbank, leading to the delineation of concessions, the construction of docks, the initiation of shipping routes and the establishment of various financial and industrial institutions.

The concession was established on the basis of commercial ports. The British

[378] 汉口租界志编纂委员会,〈综述〉,《汉口租界志》，2003. / Compilation Committee of Hankou Concession Annals, 'Summary', *Annals of Concessions in Hankou,* 2003.

established a concession in Hankou in 1861 and constructed the first foreign-built wharf along the Hankou riverside, known as Baoshun Wharf (宝顺码头).[379] Other countries also constructed various types of wharves in the riverside area of the Hankou concession to facilitate the transportation of goods. The conversion of resources and commodities into value in modern and contemporary import and export trade occurred within this logistics framework.

From 1863 to 1910, a total of 74 docks were constructed at the Hankou Trade Port. By 1926, the number of docks had peaked at 87 within the concessions.[380] The increasing presence of foreign docks along the riverside area of Hankou signifies the expansion of import and export trade activities, establishing Hankou as one of the most significant foreign trade ports among China's modern urban commercial centres.

At this time, a variety of structures—including warehouses, freight stations, docks, loading and unloading facilities, commercial firms, banks, corporations, consulates, schools, and residential buildings—emerged in the commercial port. Consequently, during the modern period of history, the riverside landscape of Hankou became significantly enriched as a result of the port's rapid development.

[379] 刘佛丁，王玉茹，*《中国近代的市场发育与经济增长》*，（北京：高等教育出版社，1996）. / Fuding Liu, Yuru Wang, *Market Development and Economic Growth in Modern China,* (Beijing: Higher Education Press, 1996).

[380] 屈凡，<近代汉口原租界码头风貌环境设计研究-以原英租界沿江大道码头景观设计为例>，（硕士论文：华中科技大学，2021），页 23-25 / Fan Qu, 'Study on the style and environment design of modern Hankou riverside concession Wharf – Take the wharf landscape of Yanjiang Avenue in the former British', (Master Thesis: Huazhong University of Science and Technology, 2021), pp. 23-25.

The development of the Hankou Trade Port landscape can be broadly categorized into four stages: the embryonic period, the development period, the flourishing period, and the decline period. During the embryonic period, the landscape of Hankou Trade Port exhibited a state characterized by simple functional demands, with the concept of planting street trees emerging during this phase.[381] Initially, the streets along the Yangtze River in the British Concession of Hankou were barren and situated in a low-lying marshland. However, due to frequent flooding from the Yangtze River, a levee was constructed along the riverbank in 1865, elevating the roadway and incorporating railings and lawns as recreational areas to separate pedestrian walkways from green spaces. This development marked the inception of public green spaces within the Hankou Trade Port.[382] Evidence from a historical photograph taken by John Thomson in 1867 reveals that the buildings in the early landscape of the British Concession were arranged to form courtyards, with a high proportion of deciduous trees and shrubs planted within them (Figure 179). Additionally, broadleaf trees were also planted along both sides of the expansive riverside road, giving the trade port the appearance of an open, elegantly landscaped residential park.



Figure 179. British Concession in Hankou along the Yangtze River, 1867. (Source: John Thomson, *Illustrations of China and Its People,* (Guangxi: Guangxi Normal University Press, 2015), p. 373.)

[381] 赖德霖，伍江，徐苏斌，*《中国近代建筑史》*，（北京：中国建筑工业出版社，2016） / Delin Lai, Jiang Wu, Subin Xu, *History of Chinese Architecture in Modern Times,* (Beijing: China Architecture Publishing & Media Co,. Ltd., 2016).

[382] 屈凡，<近代汉口原租界码头风貌环境设计研究-以原英租界沿江大道码头景观设计为例>，（硕士论文：华中科技大学，2021），页 39 / Fan Qu, 'Study on the style and environment design of modern Hankou riverside concession Wharf – Take the wharf landscape of Yanjiang Avenue in the former British', (Master Thesis: Huazhong University of Science and Technology, 2021), p. 39



Figure 180. Photograph of the street landscaping adjacent to Hankou trade port. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', Wuhan Jianghan District People's Government Official Website, 2021. <https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])

In 1880, the British concession undertook a landscape transformation of the Bund, establishing a promenade between the river embankment and the street trees for pedestrians to enjoy. The central area was covered with lawns, creating the initial 'street-greening-riverside greenway' landscape, characterized by its modern aesthetic (Figure 180).[383] Subsequently, the French, Russian, German, and Japanese concessions adopted similar practices, leading to a gradually unified and aesthetically pleasing landscape along the riverside streets within the trading port.

After 1906, the development of the landscape in the trade ports entered a period of significant growth. At this time, the concessions within the trade ports began to receive supplies of water and electricity, and streetlights were installed.[384] The flourishing momentum and superior infrastructure in the concessions led to an increase in riverside buildings and specialized docks, creating a bustling scene within the trade ports. Concurrently, the grassy areas within the concessions gradually diminished, replaced by uniquely styled commercial buildings, including those of foreign trading companies, banks and shipping firms. The various nations represented in the concessions also demonstrated a marked interest in landscape and transportation facilities, beginning to

[383] 杨乐，朱建宁，熊融，<浅析中国近代租界花园-以津、沪两地为例>，*《北京林业大学学报（社会科学版）》*，1（2003），页 17-21. / Le Yang, Jianning Zhu, Rong Xiong, 'An Analysis of the Concession Garden in Modern China – Taking Tianjin and Shanghai as Examples', *Journal of Beijing Forestry University (Social Sciences)*, 1 (2003), pp. 17-21.

[384] 汉口租界志编纂委员会，<电力>，*《汉口租界志》*，2003. / Compilation Committee of Hankou Concession Annals, 'electric power', *Annals of Concessions in Hankou,* 2003.

install streetlights, benches and fences along the streets. The concept of street trees became fully established, with trees planted on both sides of the roads. The local management authorities even employed specialized horticulturists to maintain and groom the flora. It is evident that with the continuous improvement of municipal facilities, the overall landscape within the trade ports developed into a more comfortable spatial form.



Figure 181. Photograph of the Citibank Building, completed in 1921. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', *Wuhan Jianghan District People's Government Official Website*, 2021. <https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])



Figure 182. Photograph of the Jianghan Customs House, completed in 1924. (Source: Comprehensive Service Centre of Jianghan Road Pedestrian Street, 'The Jianghan Customs Museum invites you to revisit the historical images of old Wuhan', *Wuhan Jianghan District People's Government Official Website*, 2021. <https://www.jianghan.gov.cn/xwzx/gzdt/jddt/202105/t20210518_1700108.shtml> [accessed 2 October 2023])

With the introduction and application of reinforced concrete technology, the height of buildings increased, leading to changes in architectural styles. The emergence of classical and modern styles marks a significant shift in this period. During this time, the landscape development of the Hankou Trade Port entered a phase of prosperity. Notable examples include the Citibank Building, constructed in 1921 (Figure 181), and the Jianghan Customs House, completed in 1924 (Figure 182), both of which are representative of the architectural style of the port during that era. The landscape of the trade port during this period achieved unprecedented heights in terms of scale, the types of landscape elements, and the quantity of these elements.



Figure 183. Photograph of the Hankou Trade Port landscape from 1920. (Source recreated by the author, based on the Tianyu Feng, Yong Chen, *Wuhan Images – In International Pespectives (1838-1938),* (Beijing: People's Publishing House, 2017).)

During the same period, the emergence of rooftop gardens became integrated into the landscape of trading ports. With the implementation of reinforced concrete technology, the load-bearing capacity of rooftops was significantly enhanced. Consequently, some buildings within the concessions featured rooftop gardens, providing spaces for leisure activities and offering panoramic views of the Yangtze River (Figure 183).

Beginning in 1930, the tumultuous social conditions led to a stagnation in the development of the commercial port's landscape, ultimately resulting in its decline. The flood of 1931 significantly reduced the number of vessels operating at the docks, while the floodwaters destroyed the embankments along the river, submerging the riverside avenue and halting landscape development. Following the flood disaster, the already incomplete development of the commercial port progressively deteriorated, leading to an economic decline (Figure 184).



Figure 184. Photograph of the 1931 flood at the Hankou trade port. (Source: Wuhan Art Museum, 'Wuhan Art Museum Collection: A Century of Memories from Hankou—Photographs of the Hankou Concession')

The war inflicted a devastating blow on the commercial port area, where the majority of buildings and public facilities were destroyed during the bombardments, leaving no trace of their former glory. [385]

[385] 周向频，刘源源，<从容的转型与主动的融汇-武汉近代园林的发展及对当代园林的启示>，*《城市规划学*

The Impact of Modern Urbanization on Rural Landscapes

In the modern and contemporary periods, the landscape evolution of the Jianghan Plain has been shaped not only by natural environmental factors but also by the processes of urbanization and industrialization. Since the modern era, geomorphological factors have had a profound impact on the region, particularly the unique water network landscape, which played a crucial role in shaping the transportation patterns and altering the urban-rural landscape structure. Riverways, acting as transportation arteries, made waterway transport the primary means of communication between urban and rural areas, with vessels navigating through the intricate river networks, facilitating easy movement between cities and villages. This transportation model not only contributed to the development of linear settlement patterns but also accelerated the rise of river port cities, such as Wuhan and Shashi, establishing them as important hubs for the distribution of goods. However, as the construction of roads and railways lagged behind, urban and rural spaces developed a spatial division characterized by "water-separated" zones. Although large cities like Wuhan have established road networks connecting the city with surrounding areas, these roads mostly stop at the urban boundaries, failing to penetrate deeply into rural areas. Consequently, cities rely on road transport to deliver goods to major docks, from where they are redistributed by waterways to various trade zones. By the mid-20th century, with the advancement of road construction, a composite transportation network integrating both water and land gradually emerged, leading rural markets, which were once dependent on water transport, to shift towards roads, thus prompting a reorganization of settlement patterns.

The process of industrialization further catalysed the transformation of the economic structure of the Jianghan Plain, which in turn drove changes in the landscape. The

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刊》，2（2010），页 111-119. / Xiangpin Zhou, Yuanyuan Liu, 'Mature Transition and Active Integration – The Development of Wuhan's Modern Garden and Inspiration to the Contemporary Landsacape', *Urban Planning Forum,* 2 (2010), pp. 111-119.

expansion of urban industries significantly increased the demand for goods transportation, resulting in the continuous growth of traditional market areas. New market centers emerged in transportation hubs, attracting both population and industry from surrounding villages, leading to the development of a ‘market-village’ spatial model. For example, in Hankou, an important commercial port, the flourishing of port trade promoted nearby towns to become raw material suppliers and distribution points for goods, giving rise to numerous rural workshops focused on handicrafts and agricultural product processing. At the same time, industrial waste from cities (such as manure and wastewater) was repurposed as resources for agricultural production, supporting the intensification of suburban farmland and creating a material circulation system between "cities and farmlands." The flow of resources between urban and rural areas contributed to the emergence of a unique landscape on the Jianghan Plain: the agricultural belt at the urban fringe displayed a neat, block-like distribution primarily used for vegetable cultivation, while the outer rice paddies continued the traditional large-scale rice field landscape. Together, these formed a ‘gradient’ agricultural landscape in the transitional zone between urban and rural areas. As Rhoads Murphey noted in his work:

> From any high-rise building in the city, the rice fields and rural farmers are clearly visible.[386]

Additionally, the movement of populations during the modern and contemporary periods left a profound imprint on the landscape evolution of the Jianghan Plain. On one hand, urban industrialization created numerous job opportunities, attracting a large influx of rural populations and driving the expansion of urban built-up areas. On the other hand, the reduction in rural populations led to the phenomenon of rural hollowing in some remote villages, where houses were abandoned, farmland lay fallow, and original vegetation gradually restored itself, eroding the traces of human activity. At the same time, influenced by Western architectural styles and modern lifestyles, urban

[386] Murphey Rhoads, *Shanghai: Key to Modern China*, (Cambridge: Harvard University Press, 1953), p. 12.

buildings gradually broke from traditional Chinese styles, featuring new residential apartments that integrated both Eastern and Western elements. In rural areas, brick-and-tile houses gradually replaced traditional mud brick structures, and some affluent villages even built Western-style buildings, replacing the traditional settlement aesthetics with a more modern architectural language.

Conclusion

This chapter primarily investigates the development of urban landscapes in China following the introduction of Western culture, through a study of historical documents and field surveys. During this period, the Jianghan Plain saw a gradual shift from a traditional agricultural economy to the emergence of modern industry, accompanied by an expansion of commercial trade. During the period from 1840 to 1949, the landscape of the Jianghan Plain was significantly influenced by the cultural developments from Western countries. This constituted a crucial new force that not only enriched Chinese culture but also introduced new elements to the Chinese landscape. The abundance of historical documents and preserved architectural remains from this era facilitates a more comprehensive examination of the landscape characteristics of the time.

During the Ming and Qing dynasties, urban development was relatively slow, characterized by a limited number of cities and modest urban scales. However, with the advent of modern times, the growth of commercial trade, improvements in transportation infrastructure and increasing cultural influence from Western nations led to the gradual expansion and development of cities in the Jianghan Plain. As Western commercial and industrial practices were introduced into many cities in this region, Wuhan emerged as a central urban hub. The city's scale continuously expanded, and its functions diversified beyond traditional political and commercial roles to include new functions such as industrial and financial activities. Concurrently, some cities heavily invested in light industry, leading to the rise of factory landscapes. Factories during this period were predominantly concentrated in Wuhan and represented the early stages of

industrialization in the Jianghan Plain. The establishment and operation of these factories not only introduced new growth points to the local economy but also brought distinctive changes to the landscape. Factory buildings, characterized by modern industrial styles, included features such as towering smokestacks, expansive factory spaces, bustling production lines and brightly lit structures at night, which became prominent landscape features of this era.

At this juncture, while the majority of rural areas in the Jianghan Plain continue to adhere to the traditional model of polder field settlements, significant port cities, notably Wuhan, began to undergo a transformation starting at this time. With the introduction of Western culture and the rise of modern industry, the economic structure of the Jianghan Plain underwent significant changes. During the Ming and Qing dynasties, the economy was primarily agricultural, characterized by continual improvements in agricultural production techniques and levels, and a pronounced commercialization of agricultural products. Although there was some degree of handicraft and commerce, these activities mainly centred around the processing and trade of agricultural products, resulting in a relatively homogeneous economic structure. However, in the modern era, alongside the traditional agricultural economy, modern industries began to develop, including textiles and food processing. Commercial trade also flourished, with an increase in foreign trade and a marked trend towards economic diversification. The emergence of trading ports during this period was reflected not only in the rise in trade volume but also in changes to urban landscapes. In some concession areas within the port zones, European-style architecture, Chinese architecture and hybrid styles of architecture intermingled, creating a distinctive port cityscape. For instance, in cities like Wuhan, European-style buildings such as churches, banks, foreign firms and consulates were commonplace, and construction materials and techniques became more advanced. The prosperity of the ports attracted a large influx of foreigners, enriching the cities with a diverse cultural atmosphere.

The introduction of Western technology has led to significant changes in the

transportation landscape of the Jianghan Plain. In terms of water transport, the region's intricate network of rivers facilitated the emergence and gradual replacement of traditional wooden boats with steamships. During this period, docks became crucial transportation hubs and centres for cargo distribution, with port and dock construction becoming increasingly modernized. On land, transportation also advanced with the construction of railways, such as the opening of the Jinghan Railway, which strengthened the connection between the Jianghan Plain and the outside world. Road construction began to develop, and modern transportation modes, including automobiles, started to appear.

With the continuous development and expansion of modern cities, the urbanization process in the Jianghan Plain region has accelerated. Urbanization has not only transformed the local urban landscape but has also had a profound impact on the rural landscape. Initially, Western cultural influences were primarily confined to the commercial ports along the rivers, but they gradually permeated the interior cities of the plain and eventually reached the surrounding rural areas. Consequently, the landscapes of both urban and rural areas within the Jianghan Plain have undergone significant changes, laying the foundation for the modernization of contemporary regional landscapes.

Chapter 8. Landscape after 1949 - Ecological Protection and Sustainable Development

Introduction

The establishment of New China under the leadership of the Communist Party of China provides a compelling example of how a commitment to new social values can rapidly transform a nation's landscape[387] Since the founding of New China in 1949, the landscape across the country has undergone significant changes, the Jianghan Plain being no exception. As an important agricultural production base and a region characterized by a dense inland water network, the landscape changes in this area not only reflect the trajectory of China's socio-economic development but also profoundly influence the quality of the regional ecological environment. Currently, cultivated land in the Jianghan Plain continues to occupy the largest proportion of land use (Figure 185).

[387] 段义孚，*《神州-历史眼光下的中国地理》*,（北京：北京大学出版社，2023），页 243 / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 243.

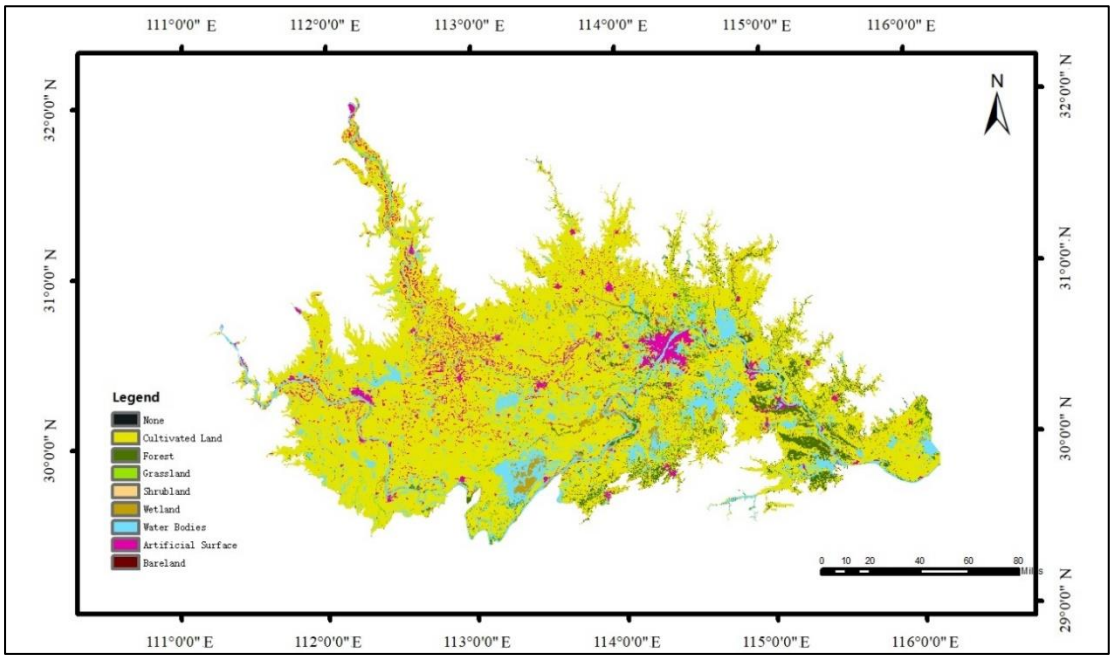


Figure 185. GIS Analysis of Land Use Distribution in the Jianghan Plain Over the Past Thirty Years. (Source: created by the author, use ArcMap)

Before the implementation of the reform and opening-up policy in China, the rural landscape of the Jianghan Plain was characterized by vast farmland, an intricate network of waterways, and scattered farmhouses. During this period, land reforms led to the redistribution of rural land ownership, enabling farmers to possess their own land, which significantly boosted agricultural productivity. The rural landscape of the Jianghan Plain retained some features of the field patterns from the Ming and Qing dynasties, with a relatively stable distribution of these fields. Agricultural production was the dominant activity in the Jianghan Plain during this time, with extensive areas dedicated to rice paddies and fish ponds. State-owned farms emerged as the primary vehicles for agricultural production, resulting in the establishment of numerous state-owned farms throughout the region.[388] Additionally, with the government's increasing emphasis on water conservancy infrastructure, a large number of reservoirs, levees, and

[388] 湖北省地方志编纂委员会，*《湖北省志.农业（下）》*, (武汉：湖北人民出版社，1999)，页 397. / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province – Agriculture (Part II),* (Wuhan: Hubei People' Press, 1999), p. 397.

irrigation channels were constructed in the Jianghan Plain, greatly enhancing agricultural production conditions while also impacting the natural landscape.

During this period, although some basic roads and bridges were constructed, land transportation conditions remained relatively underdeveloped, with only a limited number of proposed roads. Most of these roads were unpaved and could only adequately meet the transportation needs of agricultural products and the movement of people.[389] Notably, the Wuhan Yangtze River Bridge, completed in 1957, became the first bridge in China to accommodate both rail and road traffic. The establishment of the Yangtze River Bridge not only laid the groundwork for subsequent transportation developments but also became an integral part of the urban landscape as a vital piece of infrastructure. It connected the banks of the Yangtze River, enhancing the coherence and circulation of the landscape while enriching the layers and content of the region's scenery.

Following the implementation of the reform and opening-up policies, township industries began to emerge, leading to a rapid increase in industrial land use in the Jianghan Plain. Several villages have seen the establishment of factories and industrial facilities. This transformation has significantly impacted the traditional agricultural landscape, as industrial buildings gradually replace agricultural structures, and some farmland is repurposed for industrial use, resulting in increased heterogeneity in rural landscapes. Concurrently, rural residential communities are also transitioning towards a more centralized development model.

[389] 湖北省地方志编纂委员会，*《湖北省志.交通邮电》*，(武汉：湖北人民出版社，1995)，页 332. / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province – Transportation and Posts and Telecommunications,* (Wuhan: Hubei People' Press, 1995), p. 332.

At this time, significant improvements were observed in transportation conditions. While waterway transport continued to be utilized, the road network was consistently expanding, and the construction of modern highways commenced. However, the low-lying terrain, well-developed water systems, and prevalence of soft soil in the Jianghan Plain presented considerable technical challenges for railway construction. These geological conditions necessitated increased financial investment and extended construction periods, resulting in the connection of cities within the plain through railways only in 2012.[390] In contrast, some major cities on the periphery of the Jianghan Plain, such as Wuhan, already had railway lines passing through during this period, including the Jingguang Line (京广线), aimed at establishing faster and more convenient transport links between several cities in Hubei and other regions of China.

Since the beginning of the 21st century, the urbanization process in the Jianghan Plain has notably accelerated. Agricultural land surrounding cities has been gradually occupied, and urban development has expanded rapidly, leading to an increasingly blurred boundary between urban and rural landscapes. Many young people from rural areas have migrated to cities in search of employment, and have no intention of returning to the countryside. As a result, land and houses in remote villages have been left abandoned. Due to prolonged disuse and the passing of older generations, some rural areas are gradually becoming desolate. This has caused significant disruption to rural landscapes, and the continuity of traditional polder field landscapes is facing challenges. Conversely, as the population in cities continues to grow, the number of buildings is increasing, with some areas even experiencing taller structures. Behind the thriving urban landscape lies a sharp rise in population density. These changes have not only altered land use patterns but also impacted the stability and service functions of regional ecosystems.

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[390] Jingzhou Daily, 'Celebrating the 10th anniversary of the Han-Yi Railway, Jingzhou demonstrates significant progress', Jingzhou Municipal People's Government website, 2022.
<https://www.jingzhou.gov.cn/zfwxw/jzyq/202207/t20220701_744674.shtml> [accessed 19 August 2023].

To meet the demands of urban and agricultural development, hydraulic engineering has become increasingly refined and modernized. The construction of transportation infrastructure has advanced rapidly, with the continuous emergence of high-speed railways, expressways, elevated bridges and cross-river bridges, significantly enhancing the regional transportation landscape.

In 1998 and 2002, the Chinese State Council initiated nationwide programmes known as 'Returning Farmland to Lakes (退田还湖)', and 'Returning Farmland to Forests (退耕还林)'. These programmes have fundamentally transformed the previously flourishing terraced farmland landscape. The reduction in arable land has led to a conversion of some formerly cultivated areas into forested and aquatic ecosystems, resulting in a decrease in the overall scale of agricultural land. On one hand, the proportion of cultivated land within the agricultural landscape of the Jianghan Plain has diminished; on the other hand, the patterns and boundaries of certain farmlands in the Jianghan Plain region have changed, leading to the emergence of fragmented agricultural forms.

With the effective implementation of these two projects, the forest coverage in many areas of the Jianghan Plain has increased, leading to a certain degree of improvement in the ecological environment. Concurrently, the growing awareness of environmental protection has prompted several cities within the plain to establish nature reserves and wetland parks, which have played a positive role in biodiversity conservation and ecological balance.

This chapter will provide an in-depth examination of the modern landscape of the Jianghan Plain. Based on the chronological events that have influenced landscape

changes, the modern landscape will be categorized into three distinct time periods: a) 1949 to 1978; b) 1978 to 2000; and c) 2000 to the present.

Transformation of Rural Landscapes

Since 1949, the rural landscape of the Jianghan Plain has undergone significant transformation. During the nearly three decades from 1949 to 1978, extensive areas of wasteland were cultivated, leading to the emergence of farms in the plain region and the preliminary establishment of an irrigation and drainage canal system. At this time, the agricultural landscape was predominantly characterized by large-scale, organized state-owned farms, while some traditional paddy fields were preserved in low-lying areas susceptible to flooding. These paddy fields continued to play a crucial role in flood control and agricultural production through the maintenance of water management facilities such as embankments and ditches.

Following the economic reforms initiated in 1978, the introduction of the 'Household Contract Responsibility System (家庭联产承包责任制)' led to the fragmentation of farmland and an expansion in the cultivation of cash crops. Improvements in rural roads and electrical infrastructure, combined with rapid growth in industrial land in towns, resulted in significant loss of existing farmland and contributed to the fragmentation and even de-agriculturalization of the agricultural landscape. Additionally, the emergence of new landscape elements such as factories, warehouses, and commercial zones has diversified and complicated the rural landscape.

After 2000, the rural landscape of the Jianghan Plain continued to develop in a pluralistic direction. On one hand, despite being an important agricultural region, long-term agricultural development and human activities have led to a certain degree of

ecological degradation, including soil erosion and wetland shrinkage, with forest coverage declining annually. To ensure the sustainable use of land resources and restore the ecological environment, the programme of returning farmland to forests was implemented nationwide in China in 2002. On the other hand, as urban areas continue to expand and populations grow, agricultural land on the peripheries of cities is gradually being repurposed for construction, blurring the boundaries between urban and rural landscapes.

State-owned farms

Between 1949 and 1978, the agricultural landscape of the Jianghan Plain underwent significant transformation and restructuring. In the early years following the establishment of the People's Republic of China, the government mandated the establishment of state-owned farms[391], the reclamation of land, and the expansion of arable land to increase the production of commercial grain.[392] The emergence of state-owned farms laid the foundation for the primary characteristics of the agricultural landscape in the Jianghan Plain prior to 1978, establishing a distinctive rural landscape during this specific historical period.

Due to the extensive devastation caused by prolonged warfare and flooding in the Jianghan Plain prior to the establishment of the People's Republic of China, a significant portion of agricultural land was rendered desolate, leading to widespread displacement of the population. In the early years following the establishment of the People's Republic, the Chinese government initiated vigorous efforts to promote the

[391] State-owned farms are agricultural economic organizations established through investment by the Chinese government.

[392] 湖北省地方志编纂委员会，*《湖北省志.农业（下）》*，(武汉：湖北人民出版社，1999)，页 477 / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province – Agriculture (Part II),* (Wuhan: Hubei People' Press, 1999), p. 477.

development of state-owned farms in this region to restore agricultural production and enhance food output.

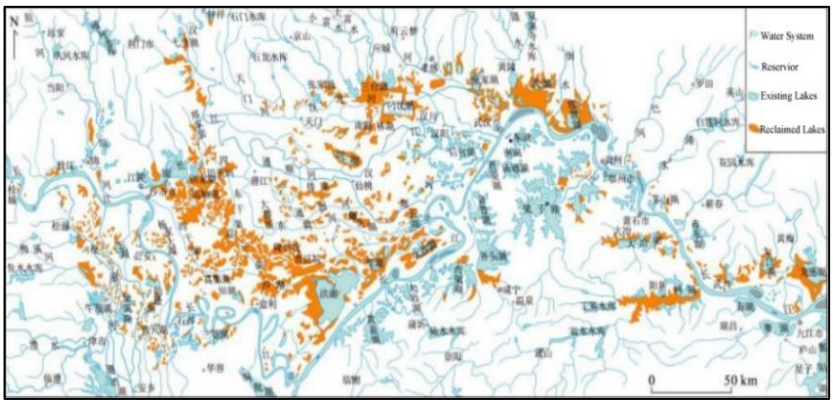


Figure 186. Changes in the reclamation of the lakes in the Jianghan Plain from 1950 to 1988. (Source: based on the '顾延生，李兇家，秦养民，祁士华，葛继稳，李伟，〈历史时期以来人类活动与江汉湖群生态环境演变〉，*《地球科学-中国地质大学学报》*，增刊 1（2013），页 133-144. / Yansheng Gu, Kuangjia Li, Yangmin Qin, Shihua Qi, Jiwen Ge, Wei Li, 'Impact of Human Activity on the Evolution of the Ecological Environment of Jianghan Lake Group in the Historical Period, Central China', *Earth Science – Journal of China University of Geosciences*, Suppl. 1 (2013), pp. 133-144.')

During this period, the Jianghan Plain exhibited significant agricultural potential due to its vast areas of lakes and wastelands. These large water surfaces and uncultivated lands became focal points for reclamation efforts. To expand the cultivated land area, continuous activities to reclaim land from lakes were undertaken in the Jianghan Plain region. Throughout this process, the establishment of state-owned farms played a crucial role in the drainage and transformation of these lakes and wastelands. A considerable amount of wasteland was converted into arable land, leading to a progressive reduction in the area of lakes in the Jianghan Plain (Figure 186). For instance, in the 1980s, Jingzhou expanded its reclaimed land area by approximately 4.0249 million mu (亩) [393], converting 1.94 million mu into farmland and establishing 18 state-owned farms. This development effectively alleviated the conflicts arising from population growth through the productive use of extensive wastelands. [394]

[393] 1 mu is approximately 666.67 square meters.

[394] 荆州水利志编纂委员会，*《荆州水利志（上册）》*，(北京：中国水利水电出版社，2016)，页 214 / Compilation

The rise of state-owned farms has significantly facilitated large-scale land consolidation and development, resulting in a contiguous landscape of cultivated land. These farms mobilize both human and material resources to reclaim wastelands, transforming vast areas that were previously barren or underutilized into organized farmland. This process alters the original natural landscape of the land, increasing both the area of arable land and its degree of concentration. For instance, the state-owned Renmin Dayuan Farm in Hubei Province, which was originally characterized by extensive marshes and dense patches of reeds, underwent reclamation as part of the policy to establish state-owned farms. With the construction and operation of these farms, a more orderly and regular plot layout gradually emerged, contrasting with the traditionally dispersed, small, and irregularly shaped farmland typical of rural areas (Figure 187).



Figure 187. Satellite imagery of the Renmin Dayuan State-owned Farm Region. (Source: based on the Google Earth)

During the Ming and Qing dynasties, the excessive exploitation of field systems led to an increasingly contradictory relationship between humans and their environment in the Jianghan Plain. Consequently, in the early years following the establishment of the People's Republic of China, the region continued to face severe flooding disasters, which contributed to low agricultural productivity. To safeguard agricultural production and improve farming conditions, people during this period constructed irrigation

Committee of Jingzhou Water Conservancy Records, *Records of Jingzhou Water Conservancy (Volume I),* (Beijing: China Water & Power Press, 2016), p. 214.

channels and drainage facilities as part of a comprehensive water conservancy system within state-run farms. This initiative significantly altered the region's hydrological landscape and conditions, allowing water resources to be utilized more effectively for agricultural production while also mitigating the adverse effects of certain water-related disasters on surrounding villages. Through systematic flood control and disaster prevention initiatives, as well as the construction of irrigation and drainage channels, farmland was organized into independent irrigation and drainage units. This modular arrangement of farmland not only enhanced flood and drought resistance but also facilitated easier management and maintenance of agricultural lands. During this process, the rural areas of the Jianghan Plain gradually developed a standardized network of intersecting waterways, resulting in a modular agricultural landscape.

Building upon this modular foundation, agricultural land is subject to further standardization and segmentation to accommodate the needs of mechanized operations. For instance, the state-owned Renmin Dayuan Farm in Hubei Province, as previously mentioned, delineates independent farms and production team living areas based on field and topographical divisions, illustrating the characteristics of standardized land segmentation (Figure 188).[395] This segmentation not only facilitates mechanized farming but also contributes to enhanced land utilization and improved agricultural production management.



Figure 188. Schematic representation of modular farmland. (Source: based on the Google Earth)

[395] 余轑，陈国孝，*《人民大垸农场志》*，(监利：人民大垸农场志编纂委员会，1988). / Zhen Yu, Guoxiao Chen, *Annals of Renmin Dayuan State-owned Farm.,* (Jianli: Compilation Committee of Annals of Renmin Dayuan State-owned Farm., 1988).

Typically, it is necessary to standardize the construction of residential housing for farm workers and various productive structures, such as warehouses, machinery storage facilities, and processing plants, on each state-owned far [396] . These buildings, in conjunction with modular farmland, contribute to the unique rural landscape of the Jianghan Plain during this period (Figure 189).



Figure 189. Aerial photographs of modular farmland in the Jianghan Plain. (Source: based on the 'Pei Zhang, Tian Zhou, 'Hubei is actively advancing the construction of large and medium-sized irrigation projects to enhance its agricultural irrigation and drainage systems.', *People's Daily*, 2022. <http://hb.people.com.cn/n2/2022/0930/c406080-40146695.html> [accessed 11 January 2023].')

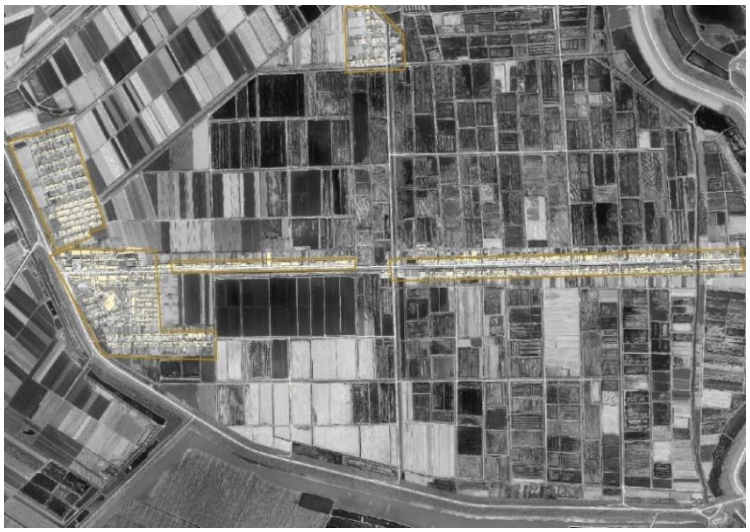


Figure 190. Primary settlement patterns within state-owned farms. (Source: created by the author, use ArcGIS Pro. Satellite imagery is sourced from Google Earth.)

Through the observation of high-resolution satellite imagery of several existing state-owned farms in the Jianghan Plain region, and utilizing GIS technology to extract and analyse building elements from these images, it can be discerned that the state-owned farms established in the early years of the People's Republic of China predominantly exhibit a clustered or linear settlement pattern as their primary landscape (Figure 190). This chapter refers to this phenomenon

[396] 余轸，陈国孝，*《人民大垸农场志》*，(监利：人民大垸农场志编纂委员会，1988) / Zhen Yu, Guoxiao Chen, *Annals of Renmin Dayuan State-owned Farm.,* (Jianli: Compilation Committee of Annals of Renmin Dayuan State-owned Farm., 1988).

as the ‘state-owned farm landscape model’. In contrast to the traditional patchwork field landscape, the land division within these farms is characterized by a pronounced modularity and mechanization, making them one of the areas with high human activity intensity during that period. This chapter posits that the emergence of this phenomenon is linked, on one hand, to the nature of state-owned farms, which is a result of collective management, and on the other hand, to the historical context, marking it as a product of its specific era.



Figure 191. Aerial photograph of terraced fields in the Jianghan Plain. (Source: captured by the author)

In addition to the modular transformation of fields, the 1970s saw the onset of agricultural reforms across China characterized by the initiatives ‘Learning from Dazhai in Agriculture (农业学大寨)’ and ‘Land Improvement for Level Fields (平田改土)’. These reforms involved converting sloped land into terraced fields in the mountainous regions and levelling land in the plains.[397] In the Jianghan Plain region, the agricultural landscape in the core areas of the plains exhibits both modular and levelled characteristics, while in the hilly areas on the periphery of the Jianghan Plain, terraced landscapes are present, albeit they represent a significantly smaller proportion compared to the levelled modular field landscapes (Figure 191).

Household contract responsibility system

The household contract responsibility system is a form of agricultural production responsibility in which farmers operate as family units to contract land and other means

[397] 湖北省统计编辑委员会，*《湖北省统计大事件》*，(北京：中国统计出版社，1993) / Hubei Provincial Statistical Editing Committee, *Major Events in Statistics of Hubei Province,* (Beijing: China Statistics Press, 1993).

of production from collective economic organizations, along with associated production tasks.[398] As a fundamental economic institution in rural China at this stage, its profound effects are evident not only in the agricultural economy but also in the significant transformation of the rural landscape.

Beginning in 1981, the household contract responsibility system was widely implemented in rural areas across China. This policy had a profound impact on rural communities throughout the country, including those in the Jianghan Plain region.[399] During this period, there were significant changes in the rural landscape characteristics of the Jianghan Plain, most notably the fragmentation of agricultural land.

The implementation of the household responsibility system for agricultural production has resulted in the allocation of collective land to individual households based on population or labour force. This has led to the fragmentation of arable land into numerous small plots, each independently managed by different farmers. This fragmentation phenomenon has caused the agricultural landscape to exhibit a pronounced state of division, with clear boundaries visible between plots, resulting in a more fragmented agricultural pattern. During this period, many fields in the Jianghan Plain region began to see an increase in field ridges, complicating land boundaries and creating a landscape where small plots of farmland interweave. This shift has altered the traditional contiguous land pattern, resulting in a vibrant and diverse agricultural landscape.

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[398] Xinhua News Agency, 'household contract responsibility system', *People's Daily*, 2014. <http://politics.people.com.cn/n/2014/1017/c70731-25854199.html> [accessed 12 August 2022].

[399] Hubei Provincial People's Government, 'The Origins of the 'Da Bao Gan Song'', *Hubei Provincial People's Government Official Web Portal*, 2022. <https://www.hubei.gov.cn/jmct/jcwh/mygc/202204/t20220427_4101630.shtml> [accessed 13 August 2022].

At this stage, farmers have gained greater autonomy in the management of their contracted land, which allows them to exercise increased discretion in selecting crops and livestock-rearing methods. Consequently, certain regions may experience a diversification of crop varieties cultivated by different households, leading to significant variations in the landscape of adjacent plots. In addition to traditional staple crops such as rice, wheat and vegetables, some farmers have begun to cultivate cash crops such as rapeseed and cotton in their fields. As a result, the agricultural landscape has become increasingly vibrant and diverse in terms of both colour and crop variety.

Following the implementation of household contract responsibility system, there has been a noticeable transformation in the structure of rural settlements, driven by the increased production enthusiasm among farmers and advancements in agricultural production. Some households have opted to relocate to areas with better transportation links or more abundant resources, thereby resulting in an expansion of settlement sizes and a reconfiguration of their layouts.

To meet the requirements of individual agricultural production, farmers often construct irrigation channels, wells, small storage facilities, and simple shelters as agricultural production infrastructure, which are scattered throughout the agricultural landscape. Some households may opt to establish temporary living quarters or rudimentary houses near their fields to accommodate needs such as resting or storing agricultural tools. This practice has, to some extent, altered the distribution patterns of settlements (Figure 192).



Figure 192. Aerial photograph of a simple storage facility in agricultural land. (Source: captured by the author)

During field research conducted in rural areas near agricultural land in the heart of the Jianghan Plain, it was observed that small villages were commonly scattered throughout these farmlands, either centrally located or near riverbanks. Typically, these villages consist of only a few dozen households, with their homes constructed on slightly elevated platforms. A review of relevant literature revealed that many of the seemingly large administrative villages are actually composed of several dispersed settlements.

Some residential structures within these settlements are relatively simple, utilizing the most economical methods to combine living spaces with shelters for livestock and storage for farming tools under a single roof. These houses generally comprise one room with windows and two windowless rooms, topped with tiled roofs. Each residence often features a small courtyard in the front or back for storing manure. It is noteworthy that, during the early implementation of the household contract responsibility system, most rural homes in the area were of this type[400] Currently, these homes are predominantly inhabited by elderly individuals and some impoverished families, while wealthier households tend to construct multi-story buildings. An increasing number of young people are opting to move to urban areas for work and living opportunities.

The transition from collective labour to family-based labour is one of the most noticeable changes brought about by household contract responsibility system. In the agricultural busy seasons of the Jianghan Plain, the labour landscape has shifted from unified collective action to a more dispersed model. Individual farmers now flexibly arrange their labour schedules and tasks based on their specific agricultural conditions and family needs. As a result of this shift in labour patterns, the scenes of labour have become increasingly diverse. Different families exhibit unique labour scenarios

[400] 鲁西奇，*《区域历史地理研究-对象与方法：汉水流域的个案考察》*，（北京：社会科学文献出版社，2019），页 209. / Xiqi Lu, *Subject Matter and Methodology for Regional Historical Geography: A Case Study of the Han River Valley*, (Beijing: Social Sciences Academic Press (China), 2019), p. 209.

depending on various factors, such as crop types, growth cycles and farming practices. From the first rays of sunlight illuminating the fields at dawn to the busy silhouettes of farmers under the evening sun, a vibrant array of labour landscapes unfolds across the rural fields of the Jianghan Plain.

Returning farmland to forests

At the beginning of the 21st century, widespread deforestation and land cultivation in China, driven by long-term practices, led to severe soil erosion, wind and sand damage, and frequent natural disasters such as floods, droughts, and sandstorms.[401] To prevent soil erosion, improve the ecological environment and ensure the sustainable use of land resources, Hubei Province fully implemented the policy of returning farmland to forest in 2002, which was suspended in 2021.[402]

Over the nearly two decades of implementing the policy of converting cropland to forest, portions of cultivated land in the Jianghan Plain region have been transformed into forested or grassland areas. This shift has altered the land use structure, resulting in increased green vegetation coverage and significantly modifying the land use dynamics of the Jianghan Plain.[403] Such transformations contribute to the reduction of soil and water erosion, enhance soil quality, and, consequently, bolster the stability and functional services of the ecosystem.

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401 Guangming Daily, 'Returning Farmland to Forests', *The History od the People's Republic of China*, 2009. <http://www.hprc.org.cn/gsgl/dsnb/zdsj/200912/t20091230_39594.html> [accessed 10 June 2023].

402 China Green Times, 'The total ecological benefit value of the reforestation project in Hubei Province exceeds 76 billion yuan.', *National Forestry and Grassland Administration Official Web Portal*, 2023. <https://www.forestry.gov.cn/c/www/dfdt/501796.jhtml> [accessed 10 June 2023].

403 吴先金，<退耕还林将给湖北带来什么？>，*《林业经济》*，1（2003），页 28-29. / Xianjin Wu, 'What impact will the reforestation of previously cultivated land have on Hubei?', *Forestry and Economics,* 1 (2003), pp. 28-29.

During this period, certain agricultural lands in the rural areas of the Jianghan Plain have been transformed into grasslands or forests, leading to an increase in vegetation cover and a significant expansion of green spaces throughout the region (Figure 193). These newly established green areas have integrated with the existing farmland and water bodies, resulting in a more natural and harmonious landscape of green villages. As illustrated in Figure 185, it is evident that the central and southern regions of the Jianghan Plain have a much larger area of forests and grasslands compared to the western region.



Figure 193. Aerial photographs of agricultural fields and green spaces. (Source: captured by the author)

Under the implementation of the policy of returning farmland to forests, there has been an increase in forest area, leading to a certain degree of restoration and improvement of the ecosystem. Firstly, biodiversity has been enhanced, as the re-emergence of natural ecological elements such as woodlands and grasslands provide pathways for the migration and reproduction of wildlife. Secondly, there is a greater diversity of plant species. Field investigations conducted in certain rural areas of the Jianghan Plain revealed that, in addition to the newly established woodlands and grasslands, local farmers have also cultivated economic forests and orchards as a source of income for their households. The varying types of vegetation present different seasonal changes as they grow, contributing unique colours to the rural landscape.

In terms of land use, the implementation of the policy of returning farmland to forest, alongside the advancement of urbanization, has resulted in an outflow of some rural populations. On one hand, many traditional and dilapidated houses are falling into disrepair due to lack of occupancy, leading to a pronounced phenomenon of village hollowing. On the other hand, certain agricultural lands have either been abandoned or consolidated and transferred to agricultural enterprises for centralized management, resulting in the gradual reorganization of smaller and irregular fields. Lands in rural areas near towns and transportation corridors are increasingly being utilized for the construction of factories and logistics bases, contributing to the expansion of built-up areas and blurring the spatial boundaries between urban and rural landscapes.

Overall, in the 21st century, the rural landscape of the Jianghan Plain has experienced notable transformations due to the returning farmland to forests policies. Although the area of arable land has diminished, there has been an increase in the greening levels of rural roads, ditches, and residential areas. The quantity and diversity of tree vegetation have risen, contributing to the sustainable development of natural resources, and some rural areas have leveraged their surrounding ecological resources to develop rural tourism. This has resulted in the emergence of eco-friendly venues such as ecological farms and wetland parks that combine ecological landscapes with leisure tourism.[404]

Multiple settlement patterns

Through the examination of satellite imagery of the Jianghan Plain region, coupled with an analysis of geographical variations and field research, this chapter categorizes rural

[404] Jingzhou Daily, 'The rural tourism in the Jianghan Plain presents a unique and captivating experience.', *Jingzhou Agriculture and Rural Bureau Official Web Portal*, 2020.
<http://nyj.jingzhou.gov.cn/ztzl_16/xczx/202005/t20200519_484058.shtml> [accessed 12 June 2023].

settlements in the Jianghan Plain following the establishment of the People's Republic of China into seven distinct patterns: 1. Dispersed settlements in the marginal areas of the plain; 2. State-owned farm model; 3. Lake marsh polder field model; 4. Plain platform model; 5. Ditch grid model; 6. Riverine model; and 7. Dispersed settlements in hilly areas. The formation and evolution of these settlement patterns are closely linked to historical events and policy contexts, including the rise of state-owned farms, the implementation of the Household Contract Responsibility System, and the Returning Farmland to Forest policy. The following section provides a synthesis and analysis of settlement patterns within the rural landscape of the Jianghan Plain based on these classifications.

1. Dispersed settlements in the marginal areas of the plain

The Jianghan Plain, predominantly characterized by flat terrain, also features certain elevated areas known as upland. In these regions, residents often opt to construct their homes on higher ground due to significant topographical variations, resulting in a dispersed settlement pattern.

Historically, the Jianghan Plain has been subject to continuous sedimentation from rivers and lakes, leading to the formation of slightly undulating upland topography. To escape flooding, the early inhabitants of the Jianghan Plain preferentially settled on these elevated terraces and natural levees, where they cultivated farmland. This adaptation to the natural environment facilitated the emergence of dispersed residential patterns and diverse agricultural landscapes. In contemporary times, following large-scale development initiatives, much of the land has been levelled, leading to a gradual decline in the prevalence of upland topography. Currently, the Jianghan Plain has undergone extensive development, resulting in the majority of the land being levelled and a gradual decline in the prevalence of terrace topography. However, such settlement

patterns have been seen to persist in the peripheral areas of Jingzhou and Shishou.



Figure 194. Aerial photograph of the plain platform model settlements in the Jianghan Plain. (Source: based on the '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 50. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 50.')

This type of settlement is typically dispersed across elevated plateaus situated among paddy fields. The main residential area is located on plateaus several metres higher than the surrounding terrain, where extensive forests are commonly cultivated alongside the dwellings. Below these plateaus lies the agricultural production zone, creating a rural landscape characterized by residences perched on elevated ground, surrounded by fields. In such landscapes, the morphology of the elevated landforms significantly influences the arrangement of both the settlements and the agricultural fields (Figure 194).

Due to the construction of ditches and roads, these settlements gradually developed into a grid or strip pattern. Analysis of satellite imagery reveals that in villages exhibiting this settlement pattern, rice fields tend to be arranged along central roads, forming agricultural areas that branch out towards lakes on either side. Ditches connecting directly to the lakes have begun to emerge between the agricultural fields to ensure the successful harvest of crops.

In the frequently flooded Jianghan Plain, selecting elevated land as a residential site is a traditional method of flood avoidance. Following the implementation of the household contract responsibility system, farmers have gained greater autonomy over land management. As a result, they may be more inclined to construct homes on elevated land close to their cultivated fields, thereby establishing such settlements.

2. State-owned farm model

After the establishment of the People's Republic of China, the government implemented extensive efforts to cultivate farmland and integrate land resources. In the Jianghan Plain region, numerous state-owned farms were established, which exhibited advanced practices in production, management, and technology, as well as a degree of scalability. These initiatives facilitated the mechanization, scaling, and modernization of agriculture, leading to the gradual emergence of flattened and modular landscape characteristics in certain rural farmlands within the plain region. Such types of rural settlements are typically constructed along the direction of the road, situated on either side of the roadway (Figure 195).

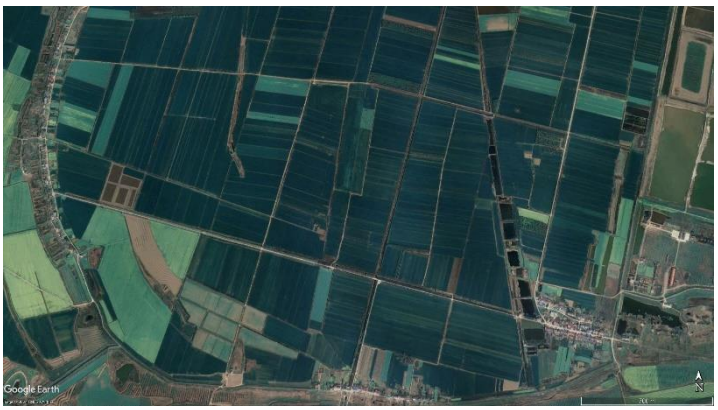


Figure 195. Satellite imagery of the state-owned farm model settlements in the Jianghan Plain. (Source: based on the Google Earth)

These state-owned farms have played a significant role in the agricultural production and economic development of the Jianghan Plain. With the implementation of the household contract responsibility system, these farms underwent corresponding reforms; however, they retained the characteristics of large-scale and intensive agricultural production organization.

3. Lake marsh polder field model

During the Ming and Qing dynasties, the construction of hydraulic levees in the central region of the Jianghan Plain led to the development of an integrated landscape of polder fields designed for flood control, drainage and water retention. This historical foundation has established a basis for the continued existence of such settlement patterns in the contemporary Jianghan Plain.

The rural settlements characterized by the river-lake embankment model are primarily concentrated in the low-lying alluvial plains and wetlands of the Jianghan Plain region. Due to the susceptibility of these areas to flooding and other hydrological disasters, the residents have had to construct elevated land through soil piling to accommodate agricultural production and habitation. This has led to the development of a rural landscape centred on the embankment fields, characterized by a spatial distribution of ‘settlements - farmland - water’.

The practice of creating farmland through lake enclosure and constructing civil embankments in the Jianghan Plain has a long-standing history; however, it has also resulted in ecological and environmental issues. Following the implementation of the returning farmland to lakes to aquatic environments, many settlements characterized by lake marsh polder field model have been compelled to dismantle or transition. In certain regions, this settlement model may still persist due to economic and livelihood needs, albeit with significantly reduced scale and quantity.

Currently, under the influence of ongoing industrialization, a segment of the lake marsh polder field settlements is gradually transforming into a hybrid enclosed farmland landscape, characterized by the division of grid-like roads and drainage ditches. These settlements coexist with another segment that has preserved the original embankment layout, collectively forming the settlement pattern of lake and marsh surrounded communities in the Jianghan Plain region (Figure 196).



Figure 196. Satellite imagery of the lake marsh polder field model settlements in the Jianghan Plain. (Source: based on the Google Earth)

4. Plain platform model

The plain platform model settlements in the Jianghan Plain are typically located on relatively elevated plateaus or regions of slight topographical undulation within the expansive plains. These plateaus are formed due to various factors, including geological processes, river erosion and human construction activities, which contribute to their natural elevation and stability. As verified in Chapter Three, the inhabitants of the plain region have constructed their dwellings on these plateaus since the Neolithic period. On one hand, the elevated terrain of the plateau-type settlements offers advantages for flood


Figure 197. Hand-drawn illustrations of the plain platform model settlements in the Jianghan Plain. (Source: hand-drawn by the author)

prevention and drainage compared to the surrounding flat plains. On the other hand, the elevated position allows residents to enjoy a broader perspective, facilitating environmental observation and agricultural activities. Near riverbanks, farmland exhibits distinct alluvial textures, with settlements dispersed in a short, linear pattern among the fields. Within the sedimentary plains, the landscape primarily consists of a combination of regular modular farmland and linear settlements oriented in a unified direction (Figure 197).



Figure 198. Aerial photograph of the plain platform model settlements in the Jianghan Plain. (Source: based on the '湖北省文物考古研究所编，*《湖北史前城址》*，（北京：科技出版社，2015），页：彩页 22. / Compiled by the Hubei Provincial Institute of Cultural Relics and Archaeology, *Prehistoric Settlements in Hubei*, (Beijing: China Science Publishing & Media Ltd, 2015), p. colour plate 22.')

Settlements of this type benefit from farmers' autonomous management and rational planning of land under the household contract responsibility system. Their houses are typically constructed along the edges of the terraces or on elevated interior areas, resulting in relatively concentrated residential zones. Agricultural fields are primarily located in the low-lying areas or flat regions surrounding the terraces, facilitating irrigation and drainage (Figure 198).

In the expansive regions of the Jianghan Plain, the levelling of land and the construction of infrastructure can facilitate the establishment of large-scale plateau-type settlements. This settlement model offers advantages in modern agricultural production and rural community development, enabling more effective utilization of land resources and enhanced production efficiency.

5. Ditch grid model

During the agricultural production process, residents constructed numerous ditches to meet the needs of irrigation and drainage. These ditches crisscrossed one another, creating a grid-like network of waterways. Consequently, residents built houses and farmland alongside or in proximity to these ditches, thereby establishing this settlement pattern.

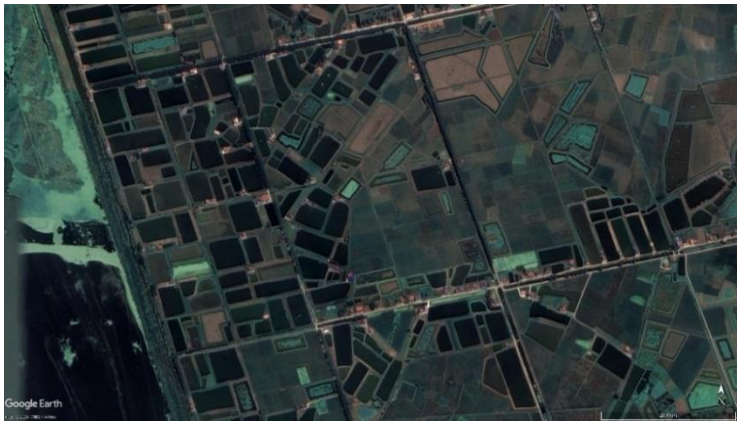


Figure 199. Satellite imagery of the ditch grid model settlements in the Jianghan Plain. (Source: based on the Google Earth)

After the establishment of the People's Republic of China, the construction of water conservancy projects resulted in an intersecting irrigation and drainage system. This system, characterized by a grid-based electric drainage channel, played a central role in the interaction between humans and the environment, leading to the modular division of agricultural land and the emergence of grid-like settlements. Following the implementation of the household contract responsibility system, farmers gained greater autonomy over land management. They improved irrigation conditions and enhanced agricultural productivity by excavating and organizing drainage ditches in their fields. In this settlement pattern, houses are typically constructed along the sides or in proximity to the ditches, creating relatively concentrated residential areas. Agricultural fields are distributed between or near the ditches, facilitating irrigation and drainage. Due to the orderly orientation and layout of the ditches, the arrangement of houses and farmland within the settlement often reflects a systematic organization, resulting in a distinctive grid-like landscape (Figure 199).

6. Riverine model



Figure 200. Satellite imagery of the riverine model settlements in the Jianghan Plain. (Source: based on the Google Earth)

The riverine settlements within the Jianghan Plain are predominantly established along the banks of the Yangtze River and its major tributaries, such as the Han River. In this settlement pattern, residential structures are typically arranged in a linear or clustered formation along the riverbanks. To mitigate flood risks and facilitate drainage, these structures are often constructed on elevated terrain or reinforced levees. Agricultural fields are situated in the vicinity of the settlements or in the flat areas along both sides of the river, which facilitates irrigation and drainage (Figure 200).

The Jianghan Plain, located in the middle reaches of the Yangtze River, has historically been a significant area for agricultural production and population settlement. Following the implementation of the household contract responsibility system, agricultural development in the riverine regions has progressed further. Concurrently, improvements in transportation and communication have transformed these riverside settlements into critical hubs for rural economic development. Today, the riverine settlements in the Jianghan Plain often serve as focal points for commerce and logistics, thereby promoting local economic growth.

7. Hilly areas dispersed model

This type of rural settlement is primarily located in the fringe areas of the northwestern Jianghan Plain. In comparison to other types of settlement landscapes, evidence of

modernization is less prevalent in this region, where residents continue to maintain a close proximity between their homes and cultivated land.



Figure 201. Satellite imagery of the hilly areas dispersed model settlements in the Jianghan Plain. (Source: based on the Google Earth)

During the field investigation, it was observed that the dispersed settlement patterns in the hilly regions of the Jianghan Plain lack a fixed layout. These settlements typically adapt flexibly to the specific topography, terrain, and availability of water resources. This adaptive spatial arrangement enables the settlements to respond better to changes in the natural environment. Due to the constraints of the terrain and variations in agricultural production conditions, farmers tend to prefer dispersed residential patterns. Compared to clustered settlements, the distances between households in hilly dispersed settlements are generally greater. This spatial dispersion allows each household to maintain relatively independent living and production spaces. The attractions between the houses are minimal, and they are consistently located on the outskirts of wooded areas, creating distinct living patches through the combination of houses and forest. Following the implementation of the Household Contract Responsibility System, farmers gained greater autonomy in selecting their residences and farming methods. Residents have effectively utilized the natural conditions of the hilly terrain, transforming their agricultural fields into terraced forms that integrate harmoniously with the natural landscape (Figure 201).

It is noteworthy that the implementation of the policy of converting cultivated land back to forest has contributed to the improvement of the ecological environment in hilly

regions and has promoted sustainable agricultural development.

Urban Ascendance

Since 1949, particularly with the onset of the 21st century, the urbanization process in the Jianghan Plain has unfolded like an unstoppable tide, profoundly transforming the geographical, economic, social, and cultural landscape of the region. Throughout this process, a series of distinctive landscape elements and characteristics have gradually emerged, becoming prominent symbols of modernization in the Jianghan Plain.

Since the Third Plenary Session of the Eleventh Central Committee in 1978, the rapid process of industrialization has acted as a driving force that continually promotes urban development.[405] During this period, the urbanization process in the Jianghan Plain region has accelerated significantly, with urban boundaries consistently expanding outward and a large number of new towns emerging. Traditional rural landscapes are increasingly being replaced by modern urban environments. This trend is evident not only in the rising number of cities but also in the continuous expansion of urban scale and the sustained improvement in the level of urbanization.

The most immediate consequence of the urbanization process is the conversion of agricultural land into land designated for construction. To accommodate the increasing demand from the urban population for residential, transportation, and industrial space, a substantial amount of high-quality farmland is being repurposed for the development of housing, commercial areas, and industrial zones. Although this shift in land use has

[405] Xinhua News Agency, 'The Third Plenary Session of the Eleventh Central Committee of the Communist Party of China (1978).', *The Chinese Central Government's Official Website*, 2009. <https://www.gov.cn/test/2009-10/13/content_1437675.htm> [accessed 13 April 2021].

contributed to economic prosperity, it poses challenges to agricultural production and food security. As interactions and integrations between urban and rural areas intensify, the traditional boundaries separating these environments have become increasingly ambiguous. On one hand, rural areas surrounding cities are gradually integrating into urban economic circles, thereby becoming critical supports for urban development; on the other hand, urban residents' lifestyles and consumption patterns are also infiltrating rural areas, driving their modernization. This trend is leading to a gradual reduction in landscape disparities between urban and rural areas, resulting in a new appearance characterized by integration and coexistence.

Another significant phenomenon associated with the process of urbanization is the large-scale migration of populations. Many young individuals from rural areas are leaving their hometowns in search of better employment opportunities and improved living conditions, resulting in a pronounced outflow of labour and an increasingly severe issue of population aging in rural regions. Consequently, many remote villages are experiencing the phenomenon of abandoned land and housing, with some villages gradually descending into decline and desolation. The rural landscape, which serves as an important cultural heritage and ecological resource in the Jianghan Plain region, is facing unprecedented challenges during the urbanization process. The continuity of traditional polder field landscapes is under threat, as numerous historically significant villages and structures have been demolished or left to decay. The degradation of the rural ecological environment has exacerbated the fragmentation and homogenization of the landscape.

In contrast to the fragmentation of rural landscapes, urban architecture exhibits a trend toward increased density. To accommodate a growing population and industrial activities, buildings in urban areas are being constructed to greater heights and closer together. This trend of high-density architecture not only transforms the skyline of cities

but also has significant implications for urban transportation and ecological environments.

Rural-Urban Fringe

As urbanization progresses, cities are continuously expanding, attracting a significant influx of rural populations to urban areas. This increase in demand for urban construction land has gradually extended into surrounding rural regions, resulting in the emergence of unique landscapes that exist between urban and rural settings in some cities of the Jianghan Plain region. Here, one can observe a blend of urban high-rises, factories, and commercial facilities with rural elements such as farmland and cottages. This area showcases both modern urban characteristics and remnants of rural identity. The formation of these urban-rural fringes is a long-standing phenomenon generated by economic development, manifesting in the suburban lands surrounding built-up urban areas. It represents a distinctive outcome of the urbanization process in China.[406]

However, this expansion has also given rise to several issues. The complexities inherent in managing areas situated at the intersection of urban and rural administration hinder effective oversight. Urban management struggles to reach every corner of these regions, while rural management proves inadequate in addressing emerging development needs. As a result, various problems have surfaced in areas such as environmental sanitation and landscape maintenance. There is often a proliferation of temporary structures, which tend to be constructed haphazardly, alongside numerous parcels of undeveloped land that lack effective planning and utilization. This situation has led to a pronounced disorder in the overall landscape.

[406] 许月明，梁山，<城乡结合部耕地保护问题研究>，*《经济问题》*，10（1998），页 34-37 / Mingyue Xu, Shan Liang, 'A Study on the Protection of Cultivated Land in the Urban-Rural Fringe Areas', *On Economic Problems,* 10 (1998), pp. 34-37.

In the Jianghan Plain region, municipal governments have implemented a series of comprehensive measures to address issues related to the urban-rural fringe. These measures include: 1. Enhancing urban and rural planning by developing scientifically sound and reasonable development strategies and strictly regulating land use; 2. Improving infrastructure, including roads; 3. Strengthening environmental management and ecological protection while addressing pollution; 4. Enhancing public services, with a focus on education, healthcare, and cultural initiatives in urban-rural fringe areas; 5. Strengthening land management; 6. Promoting community development by establishing effective management mechanisms and fostering a sense of belonging among residents, as well as providing employment training; 7. Improving residents' employment skills to meet urban job market demands.[407] These initiatives have alleviated some issues within the urban-rural fringe to a certain extent, promoted coordinated urban-rural development, and optimized the transitional landscape between urban and rural areas in the Jianghan Plain region.

Urban development in Wuhan

Wuhan, the largest city in the Jianghan Plain, serves as a striking example of rapid urban development. The population of Wuhan grew from 2.67 million in 1949 to 5.55 million in 1978, [408] and reached a total of 10.81 million in 2022. [409] Over the span of more

[407]Xuyang Huang, 'Accelerate the development of urban-rural fringe areas to establish the premier region in southern Hubei', *Xianning Xian'an District Committee of the Chinese People's Political Consultative Conference Official Website*, 2012. <http://www.xaqzx.gov.cn/page38?article_id=392> [accessed 10 March 2022].

[408] Wuhan Municipal Bureau of Statistics, 'Stable Growth in Total Population and Significant Improvement in Population Quality', *Wuhan Municipal Bureau of Statistics Official Website*, 2019.
< http://www.xaqzx.gov.cn/page38?article_id=392> [accessed 09 May 2022].

[409]Ministry of Housing and Urban-Rural Development of the People's Republic of China, '2022 Urban Construction Statistical Yearbook', *Ministry of Housing and Urban-Rural Development of the People's Republic of China Official Website*, 2023. < https://www.mohurd.gov.cn/gongkai/fdzdgknr/sjfb/tjxx/jstjnj/index.html > [accessed 20 November 2023].

than seventy years, the city has experienced significant population growth. This remarkable increase can be attributed in part to Wuhan's status as the capital of Hubei Province, as well as the continuous expansion of the city's boundaries.

In the early years following the establishment of the People's Republic of China, Wuhan was characterized by a multitude of challenges and a need for revitalization. During this period, the city's boundaries were primarily confined to the traditional urban areas of Hankou, Wuchang, and Hanyang. Initial industrial development commenced, with several factories established on the outskirts of the urban area; however, the pace of urban expansion was relatively slow. The city's growth primarily occurred along the banks of the Yangtze River and Han River, as well as through small-scale expansions near key transportation hubs. [410]

Wuhan, located in the southeastern part of the Jianghan Plain, is situated in an area characterized by a network of lakes, where the Yangtze River and the Han River converge. As a result, bridges are essential for the city. [411] Historically, however, there were no bridges spanning the Yangtze River to connect the three towns of Wuhan—Wuchang, Hankou, and Hanyang—by land. The prosperity of the Yangtze River in Wuhan during the Ming Dynasty is vividly depicted in the work of the painter Ying Qiu (仇英), particularly in the 'Jianghan Scenic View (江汉揽胜图)' which illustrates a thriving scene yet notably lacks any bridges across the river, forcing residents to rely solely on water transport to traverse between the three towns (Figure 202).

[410] Compilation Committee of Wuhan Local Chronicles, '1954 Wuhan Urban Master Plan', *Wuhan Municipal Chronicle - Urban Construction Volume*, 1989.
< http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/1021/category_id/379701.html> [accessed 28 June 2022].

[411] Compilation Committee of Wuhan Local Chronicles, 'Urban Bridges', *Wuhan Municipal Chronicle – Volume 1*, 2006. < http://szfzg.wuhan.gov.cn/book/dfz/bookread/id/971/category_id/346501.html > [accessed 28 June 2022].



Figure 202. The 'Jianghan Scenic Views' illustrated by Ying Qiu during the Ming Dynasty. (Source: Ying Qiu, 'Jianghan Scenic Views', *Wuhan Museum Official Website*, <http://whmuseum.com.cn/collection/painting/d7ac60f8f26fc24b0af377d593a4e4b9> [accessed 29 June 2022].)

This historical situation changed with the construction of the Jianghan Bridge and the Wuhan Yangtze River Bridge in 1956 and 1957, respectively, which enabled land travel between the towns. [412] The Wuhan Yangtze River Bridge serves as a dual-purpose structure for both road and rail, effectively integrating the rail and road networks of southern and northern China, establishing a reliable and regular connection between these regions.[413] Today, 13 bridges span the Yangtze River in Wuhan, contributing significantly to the city's transportation infrastructure and cultural landscape (Figure 203). [414]

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[412] 湖北省地方志编纂委员会，*《湖北省志.城乡建设》*，(武汉：湖北人民出版社，1999)，页 68 / Compilation Committee for Local Chronicles of Hubei Province, *The Gazetteer of Hubei Province – Urban and Rural Development,* (Wuhan: Hubei People' Press, 1999), p. 68.

[413] Zhiwen He, 'One Bridge Spans North and South — A Historical Reflection on the Construction of the Wuhan Yangtze River Bridge', *National Museum of China Official Website*, 2022, <https://www.chnmuseum.cn/zj/jzrgs/202207/t20220713_256740.shtml> [accessed 12 October 2022]

[414] Hubei Daily, 'The construction of the main pier's first pile for the 13th Han Nan Yangtze River Bridge in Wuhan

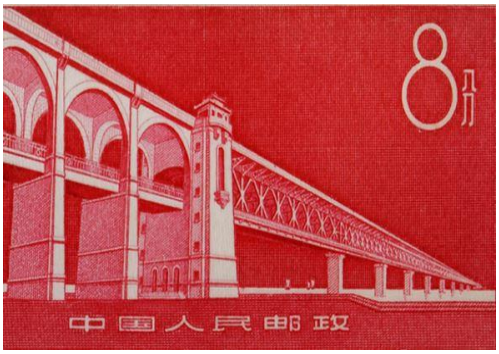


Figure 203. Commemorative Postage Stamp of the Wuhan Yangtze River Bridge. (Source: Zhiwen He, 'One Bridge Spans North and South — A Historical Reflection on the Construction of the Wuhan Yangtze River Bridge', *National Museum of China Official Website,*2022.<https://www.chnmuseum.cn/zj/jzrgs/202207/t20220713_256740.shtml>[accessed 12 October 2022].)

Following the reform and opening-up in China, Wuhan experienced rapid economic growth, accompanied by an accelerated pace of urban development. New industrial and residential areas have emerged continuously, resulting in a marked expansion of the city's boundaries. [415] As the 21st century commenced, Wuhan entered a phase of rapid advancement. The ongoing enhancement of the urban transportation network, particularly the construction of subway lines, has facilitated comprehensive urban expansion. From vantage points along both banks of the Yangtze River, the skyline is characterized by an array of well-organized buildings that outline a magnificent silhouette against the backdrop of blue skies and white clouds. Skyscrapers have risen like bamboo shoots after rain, creating a striking contrast with historical structures such as the Yellow Crane Tower and the Yangtze River Bridge, illustrating Wuhan's unique charm that blends the ancient with the modern. At night, the brilliant lights embellish the city skyline, becoming a prominent feature of Wuhan's nighttime scenery.

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has commenced, facilitated by the implementation of the Sixth Ring Road.', *Department of Transportation of Hubei Province Official Website*, 2024 <https://jtt.hubei.gov.cn/bmdt/mtkjt/202406/t20240604_5226199.shtml> [accessed 22 July 2024]

[415] Compilation Committee of Wuhan Local Chronicles, 'Overview', *Wuhan Municipal Chronicle – Urban Construction Volume*, 1989. <http://szfzg.wuhan.gov.cn/book/dfz/bookall/id/1021/category_id/379620.html> [accessed 28 June 2022].

Metropolitan Area

In December 2007, the Wuhan Metropolitan Area was officially established. This urban circle centres around the city of Wuhan and encompasses nine surrounding cities: Ezhou, Huanggang, Huangshi, Xianning, Xiaogan, Tianmen, Xiantao, and Qianjiang. Covering an area of 57,800 square kilometres, it has a population of approximately 31.23 million. [416] Geographically, these nine cities are located within the Jianghan Plain region (Figure 204). The emergence of the Wuhan Metropolitan Area signifies a transition in which cities are no longer isolated entities within a region, but rather begin to exhibit characteristics of collective scale. As these cities develop collaboratively, their boundaries continue to expand into rural areas alongside the formation of the metropolitan area.

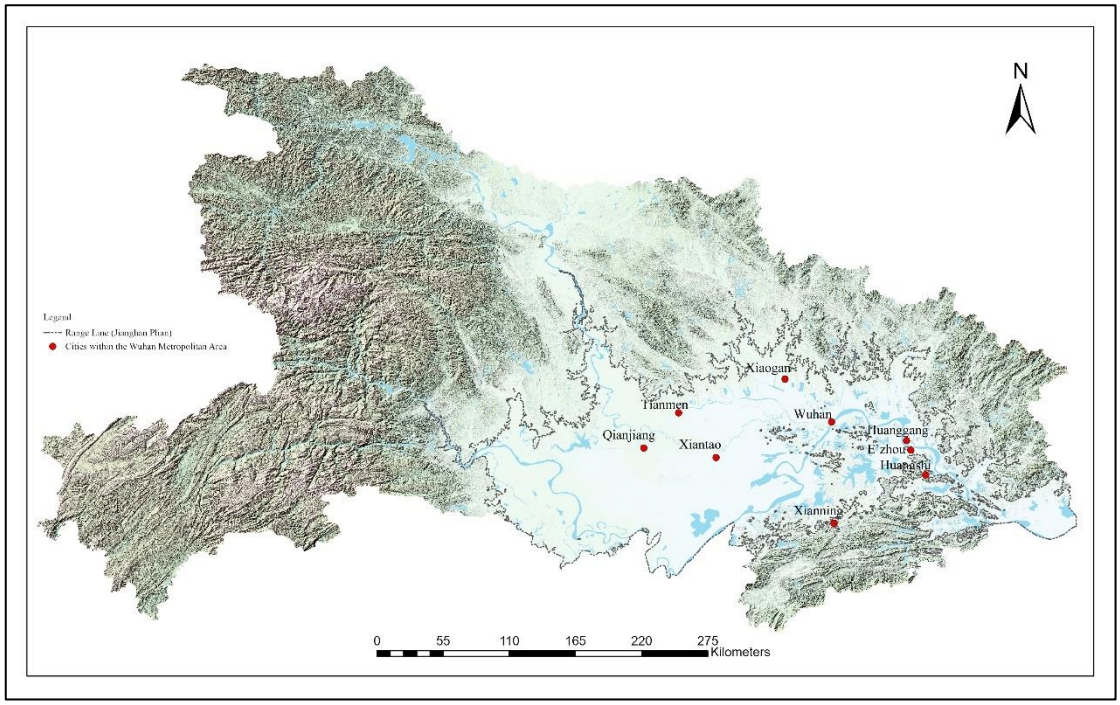


Figure 204. Distribution Map of Cities in the Wuhan Metropolitan Area. (Source: created by the author, use ArcGIS Pro)

[416] Compilation Committee of Wuhan Local Chronicles, 'Overview', *Overview of Wuhan City (2020)*, 2020. <http://szfzg.wuhan.gov.cn/book/dfz/bookread/category_id/355621/id/988.html> [accessed 29 June 2022].

The formation of the Wuhan metropolitan area has facilitated the expansion of cities within the region, leading to an increase in urban development land. Modern urban landscapes, such as high-rise buildings, commercial centres, and industrial parks, have continuously emerged across the cities of the Jianghan Plain. The prosperity of commerce is nearly synonymous with the modernization of the urban landscape.[417] The metropolitan area has brought about a more sophisticated transportation network, including highways and intercity railways, which have transformed the regional transportation landscape, and the construction of urban infrastructure, such as electricity networks, communication systems and elevated bridges, has introduced new elements to the landscape.

However, for long-time residents of these cities, urban development has rendered once-familiar places increasingly unfamiliar. In the past, the old streets and alleys were lined with ancient cobblestone pathways that bore the marks of time, and the old buildings along the streets were arranged in a manner that reflected the essence of daily life. Yet, today, these historic structures are gradually disappearing; the streets are being widened and rebuilt, and the traditional living areas are slowly being erased. In their place, towering modern residential buildings, generally surpassing the height of the former structures, now stand prominently in the bustling urban landscape, significantly altering the character of the city.

Urban residents are increasingly confined to towering high-rise buildings, resulting in a diminishing sense of community and neighbourhood. With the proliferation of new place names, familiar locales have transformed into foreign environments, erasing the foundations of life for the older generations as the landscapes they once knew vanish. The once vibrant traditional marketplace, characterized by the sounds of lively

[417] 段义孚，*《神州-历史眼光下的中国地理》*，（北京：北京大学出版社，2023），页 276. / Yi-Fu Tuan, *Shenzhou: A Historical Geography of China*, (Beijing: Peking University Press, 2023), p. 276.

bargaining and haggling, has now been replaced by modern commercial centres. Likewise, the meandering bluestone alleyways, which held countless childhood memories and laughter, are gradually disappearing amid urban redevelopment efforts.

The memories of urban residents regarding their historical districts are increasingly preserved through old photographs, videos, and written accounts, which serve as the last vestiges of their emotional connections to these places. In this context, there is a growing demand for the protection and even the reconstruction of historical and cultural landscapes. The reemergence of representative local cultural landscapes in the lives of residents has become a shared vision for those living in these cities. The goal is to reintegrate familiar and cherished landscapes into daily life, ensuring that these urban areas retain their unique regional charm and cultural heritage amidst the process of modernization.

Conclusion

Overall, since the establishment of the People's Republic of China in 1949, the landscape of the Jianghan Plain has undergone significant changes and updates. Both rural and urban areas have experienced profound transformations, reflecting a diverse array of characteristics and a progressive development in environmental awareness.

In terms of rural landscape, several policies collectively influenced the transformation of the Jianghan Plain's rural environment following the establishment of the People's Republic of China. From the founding of the new China in 1949 until the onset of the Reform and Opening Up period in 1978, the Jianghan Plain, as a traditional agricultural region, continued to prioritize agricultural production during this time. The implementation of land reform enabled farmers to acquire land, thereby enhancing their

production enthusiasm. The rise of state-owned farms during this period facilitated extensive land consolidation and development, resulting in a contiguous landscape of cultivated land. Within these state-owned farms, irrigation channels and drainage facilities were constructed as part of a comprehensive system for water conservancy projects. Systematic flood prevention and disaster mitigation efforts, along with the establishment of irrigation and drainage channels, segmented the farmland into distinct irrigation and drainage units. Uniform residential buildings for farm workers and functional structures such as warehouses, agricultural machinery sheds, and processing facilities were constructed across each state-owned farm. These concentrated buildings, in conjunction with the modular farmland, characterized the unique rural landscape of the Jianghan Plain during this era. The emergence of state-owned farms contributed to the formation of well-organized and large-scale settlement patterns in certain areas, leading the way toward agricultural modernization.

From the period of Reform and Opening Up until the end of the 20th century (1978-2000), agriculture in the Jianghan Plain experienced rapid development opportunities. The implementation of the Household Contract Responsibility System significantly motivated farmers, resulting in substantial improvements in agricultural production efficiency. Agricultural mechanization gradually gained traction, with small tractors, harvesters, and other machinery progressively entering rural areas. Concurrently, the agricultural planting structure was continuously optimized, with an increase in the cultivation of new economic crops alongside traditional agricultural products. Following the introduction of the Household Contract Responsibility System, farmers gained greater decision-making power regarding production, leading to a more flexible, diverse, and self-sustained rural landscape. Different regions developed unique settlement forms based on their specific conditions and the choices of farmers. The Household Contract Responsibility System invigorated farmers' productive capabilities, resulting in a revitalization of rural residences and cultivation methods in some areas of the Jianghan Plain. The hilly areas dispersed and the plain platform model benefited

from the autonomy in land management and rational planning afforded to farmers under this system. Additionally, the implementation of the returning farmland to forests policy not only improved the ecological environment but also facilitated the transformation of previously agrarian areas into settlement models that emphasize ecological conservation.

In terms of urban landscape, during the period from the establishment of the People's Republic of China to the pre-reform and opening-up era (1949-1978), the cities in the Jianghan Plain exhibited small scales and relatively slow development. Wuhan and Jingmen emerged as the primary urban centres, with urban functions predominantly focused on administration, commerce, and small-scale industry.

From the reform and opening-up period until the end of the 20th century (1978-2000), urban development accelerated, leading to continuous expansion of city sizes and gradual enhancement of urban functions. Several cities experienced rapid advancements in industrial, commercial and service sectors, accompanied by significant improvements in urban infrastructure, including roads and bridges. This progress enhanced the attractiveness and influence of these urban areas.

As reforms deepened, township enterprises in the Jianghan Plain began to flourish, becoming crucial pillars of the rural economy.

From the early 21st century to the present (2000-present), Wuhan, as the core city of the Jianghan Plain, has experienced rapid development and continuous expansion of urban scale. The ongoing improvement of infrastructure and the continuous optimization and upgrading of industrial structures have not only stimulated regional economic prosperity but also reshaped the urban landscape. The establishment of

Wuhan Metropolitan Area has further strengthened inter-city connections and collaboration, facilitating the optimal allocation of resources and collaborative development. During this time, the process of urban-rural integration has accelerated, resulting in closer ties between rural and urban areas and a gradual reduction in disparities. The urban-rural fringe has gradually formed, emerging as a unique transitional zone between city and countryside.

Change and renewal are defining characteristics of our era. One of the most immediate consequences of urbanization is the transformation of arable land into developed land, resulting in the extensive appropriation of high-quality farmland for residential, commercial, and industrial construction. As urban areas expand rapidly, the resulting discord and conflict between urban and rural landscapes have become increasingly evident. Many young individuals from rural areas migrate to cities in pursuit of better employment opportunities and living conditions. This population shift exacerbates labour shortages and contributes to the aging demographic in rural regions. Consequently, many remote villages experience phenomena such as land and housing abandonment, with some even facing gradual decline and desolation. The blurring of landscape boundaries between urban and rural areas, the gradual deterioration of rural spaces, and the disappearance of traditional urban landscapes are pressing issues that necessitate resolution. As the natural environment evolves, so too do human activities; the interplay between human actions and the natural environment continues to significantly influence the formation and alteration of landscapes.

Chapter 9. Discussion and Conclusion

This PhD research project uses the historical landscape development of the Jianghan Plain as a case study to gain insights into the broader context of landscape development in China. The author employs a variety of research methods to conduct an in-depth investigation of the landscape development history of the Jianghan Plain and presents the findings. A comprehensive discussion of the results will follow, addressing the research questions and methodologies outlined in the thesis, leading to the conclusions drawn from the project.

Discussion

The making of the Jianghan Plain landscape is a complex process shaped by the long-term interaction between the natural environment and human activities (Table 4). In terms of human influence, the landscape changes of the Jianghan Plain have been profoundly affected by human activities across various historical periods. During the Palaeolithic era, humans subsisted through hunting and gathering, with activities primarily concentrated along the edges of the plain, resulting in minimal landscape alteration. In the Neolithic period, early humans selected settlement sites based on the natural environment, gradually forming settlements, developing primitive agriculture, and cultivating rice fields. This period saw the emergence of central settlements, the construction of basic water management infrastructure, and simple dwellings, marking the beginning of landscape transformation.

Historical Period	Primary Cultures
Palaeolithic Age	Primitive Hunting and Gathering
Neolithic Age	Primitive Hunting and Gathering and Primitive Agriculture
Bronze Age	Bronze Age Culture, Central Plain Culture, and Chu State Culture

Qin Dynasty to Yuan Dynasty	Buddhist Culture and Water Conservancy Culture
Ming Dynasty to Qing Dynasty	Immigrant Cultures and Agricultural Culture
Modern and Contemporary Period	Western Culture, Commercial and Industrial Culture
After 1949	Industrialization and Urbanization Culture, and Modern Agricultural Culture

Table 4. A summary of the major cultural influences on the landscape of the Jianghan Plain throughout different historical periods. (Source: created by the author)

During the Bronze Age, populations began migrating further inland, establishing a multi-layered settlement system. They managed water resources more effectively, expanded agricultural land, and constructed additional water management systems. The introduction of palaces and gardens further enriched the regional landscape. Between the Qin Dynasty and the Yuan Dynasty, the state spearheaded large-scale water conservancy projects, while local communities actively participated in building smaller-scale water management structures. Farmers contributed to landscape shaping by constructing dikes and reclaiming land for agriculture. Additionally, population migrations caused by warfare led to denser settlements, strengthened urban defences, and the introduction of Buddhist landscapes, further catalysing landscape change.

In the Ming and Qing periods, massive waves of immigration led to land reclamation, the creation of polders around lakes, and the continuous expansion of farmland. The water management system was further improved, and settlement patterns shifted from dispersed rural settlements to more centralized communities, giving rise to distinct water-town and market town landscapes. Architectural styles also became more diverse. In modern times, rural areas have largely retained the traditional pond-based settlement model, while cities along the Yangtze River have been influenced by commercial and

industrial development, as well as Western culture. Factories, commercial ports, and concession buildings have emerged, contributing to a cityscape that blends Chinese and Western characteristics.

In contemporary times, with the advancement of industrialization and urbanization, urban developers, industrial workers, and agricultural producers have driven the dominant position of urban and industrial landscapes. Agricultural production has become more modernized, with farmland layouts becoming increasingly standardized. Both rural and urban landscapes now exhibit significant modern characteristics.

In addition to the profound influence of human activities on the shaping of the Jianghan Plain landscape, the natural environment has played an equally important role (Table 5). The formation of the Jianghan Plain landscape has been deeply impacted by climatic changes and the evolution of the ancient Yunmengze lake system, which together have acted as core driving forces behind the region's landscape transformation. During the Palaeolithic period, the climate was greatly influenced by alternating ice ages and interglacial periods. The cold and dry conditions of the Last Glacial Maximum limited human activities to the edges of the plain and the transitional zones to the hills, where hunting and gathering were predominant. At that time, the ancient Yunmengze lake system covered most of the plain, and sediment from the Yangtze and Han rivers began to slowly accumulate in the western part of Yunmengze. The natural landscape, dominated by primeval forests, grasslands, and lakes, prevailed, with minimal human alteration.

Historical Period	**Climate Characteristics**	**Evolution of the Yunmengze Ancient Cluster**	**Impact on the Jianghan Plain Landscape**
Palaeolithic Age	The climate	The majority of the	1. Human activities

	alternated between glacial and interglacial periods, with the Last Glacial Maximum characterized by cold and arid conditions.	Jianghan Plain is occupied by the sedimentation of the Yangtze River and Han River, which gradually accumulates in the western region.	were primarily concentrated on the edges of plains, with hunting and gathering as the dominant subsistence practices. 2. The landscape consisted mainly of pristine forests, grasslands, and lakes, with minimal human alteration of the natural environment.
Neolithic Age	Frequent climate fluctuations, unstable precipitation patterns, and the significant threat of flooding to human populations.	1. During the dry season, the lake's surface recedes, resulting in the formation of mudflats, wetlands, and other related features. 2. During the flood season, the lake's surface expands, leading to the coalescence of connected water bodies.	1. The settlements are distributed at elevated locations along the edges of the plains, initially dispersed, with the emergence of central settlements in later stages. 2. The residents engaged in the development of primitive rice cultivation, with farmland being dispersed. 3. People constructed rudimentary flood control structures and began modifying the natural landscape.
Bronze Age	The subtropical monsoon climate is relatively stable.	The continuous contraction results in a gradual expansion of land area.	1. Humans migrated into the plains, resulting in the formation of a multi-tiered settlement system. 2. Urban centres emerged, leading to enhanced control over water resources, the expansion of agricultural land, and

			the development of water infrastructure and architectural structures such as palaces, which contributed to the diversification of the landscape.
Qin Dynasty to Yuan Dynasty	Climate exhibits variability, with periods such as the Little Ice Age and droughts contributing to the occurrence of floods and drought-related disasters.	The main body of the Ancient Yunmengze Lake Cluster has been compressed, with the lake surface fragmented. The plain has expanded eastward, while the lakes have contracted toward the southeast.	1. The hydrological system has undergone significant changes due to extensive human construction of water management infrastructure. 2. Settlements have become more densely populated because of warfare and population migration. Towns have enhanced defensive structures, and while landscape development has been relatively slow, it has continued to evolve over time.
Ming Dynasty to Qing Dynasty	The fluctuations in climate exacerbate the occurrence of flooding.	The ancient Yunmengze lake cluster further disappeared, and the landmass in the interior of the Jianghan Plain was largely formed.	1. Residents began large-scale lake encirclement and land reclamation, resulting in the formation of polders and an agricultural landscape. 2. Settlement patterns transitioned from dispersed to concentrated, with distinct regional landscapes emerging. 3. Urban planning became more structured, leading to a diversity of architectural styles.
Modern and	Continuation of the	The Ancient	1. Rural areas maintain

Contemporary Period	characteristics of the subtropical monsoon climate.	Yunmengze Lake Cluster has largely disappeared, and the landscape has become relatively stable.	a settlement model centred around polder fields. 2. Riverine cities introduce commercial and industrial activities, leading to the establishment of factories and trade ports, with architectural styles in the concession areas reflecting a blend of Eastern and Western influences.
After 1949	Under the context of global climate change, the risk of extreme weather events is increasing.	The geomorphological pattern is stable.	1. The acceleration of industrialization and urbanization has led to the dominance of urban and industrial landscapes. 2. Agriculture is progressing towards modernization, with an emphasis on the standardization and modularization of farmlands, while simultaneously confronting new challenges such as environmental pollution and ecological imbalance.

Table 5. The impact of climate variations and changes in the ancient Yunmengze Lake cluster on the landscape of the Jianghan Plain across different historical periods. (Source: created by the author)

During the Neolithic period, frequent climate fluctuations and unstable precipitation patterns, which led to flooding threats, significantly influenced human life and production. The ancient Yunmengze lake system would shrink during dry periods, exposing diverse landforms such as mudflats and wetlands. During flood periods, the

lake would expand, often merging into a vast water body. To avoid flooding, human settlements were primarily located on higher ground at the edges of the plain, with early settlements being scattered. Over time, central settlements with early forms of urban structures emerged. People began to develop primitive rice cultivation, and although the agricultural scale was small and dispersed, early inhabitants cooperated to build rudimentary flood control works, such as ditches and embankments. This marked the beginning of human-driven modification of the natural landscape.

During the Bronze Age, the relatively stable subtropical monsoon climate, combined with the continuous shrinkage of the Yunmengze lake system due to sediment accumulation and the consequent expansion of terrestrial areas, prompted human migration towards the interior plains. Relying on the main course and tributaries of the Yangtze River, a hierarchical settlement system gradually emerged, with numerous large and small urban centres appearing. These settlements demonstrated more rational control over water resources, significant expansion of arable land, and the introduction of small-scale irrigation facilities such as minor canals. The emergence of architectural features including palaces and elevated platforms further enriched the regional landscape, with a notable increase in the proportion of anthropogenic landscapes.

Between the Qin and Yuan dynasties, climatic fluctuations induced disasters such as floods and droughts, leading to the compression of the main body of the Yunmengze lake system, resulting in a fragmented lake surface. The plain expanded eastward, while the lakes receded towards the southeast. In response to environmental changes, humans actively constructed hydraulic engineering projects, with large-scale state-led endeavours such as the Jingjiang embankment (荆江大堤) complemented by widespread grassroots construction of smaller facilities. Warfare and population migrations contributed to denser settlement distributions, with continual improvements in urban defensive structures. The introduction of Buddhist landscape elements added

a distinctive cultural dimension to the landscape during this period. Despite relatively slow development, the landscape remained in a dynamic state of change.

From the Ming to the Qing dynasty, the relatively stable social and climatic conditions were conducive to agricultural development; however, extensive land reclamation exacerbated water-related hazards induced by climatic variability. The influx of large numbers of immigrants led to extensive land reclamation and lake enclosure for farming, giving rise to the distinctive 'polder field' agricultural landscape. The Jianghan Plain consequently became a significant grain-producing region, with a progressively refined system of hydraulic engineering. Settlement patterns shifted from dispersed to clustered forms, exhibiting spatial differentiation according to geographic environments: peripheral settlements remained scattered, densely clustered water-town settlements dominated the hinterlands, and numerous towns emerged along rivers. Urban planning became more systematic, and architectural styles diversified.

In the modern era, the subtropical monsoon climate persisted; however, the introduction of Western culture and the development of industry and commerce profoundly transformed the Jianghan Plain's landscape. Rural areas continued the polder field settlement model, whereas riverine cities such as Wuhan and Shashi experienced the emergence of factories and commercial ports. Within foreign concessions, European, Chinese, and hybrid architectural styles coexisted, significantly altering urban landscapes.

In contemporary times, against the backdrop of global climate change, the Jianghan Plain faces challenges from an increased frequency of extreme weather events, although its geomorphological pattern has stabilized. Accelerated industrialization and urbanization have resulted in urban and industrial landscapes predominating.

Agricultural production has advanced toward modernization, characterized by standardized and modular field layouts. Despite unprecedented human capacity for landscape modification, associated issues such as environmental pollution and ecological imbalance have emerged, necessitating urgent resolution.

It should be emphasized that the formation of the Jianghan Plain's landscape is a complex process influenced by a multitude of factors beyond climate and the evolution of the Yunmengze lakes. These include geological structures, soil conditions, river course changes, and human activities. Natural factors laid the foundation for landscape evolution, with the plain's original topography of interspersed plains, lakes, and hills, abundant water resources, and favourable climatic conditions providing space and resources for human survival and development. Nonetheless, frequent flooding disasters and complex hydrological patterns posed constraints on human activities, prompting early inhabitants to adapt and transform their environment through hydraulic engineering and strategic settlement placement. With the advancement of human civilization, the influence of anthropogenic activities on landscape formation has continuously intensified — from early agricultural cultivation and settlement construction to modern industrialization and urbanization — resulting in ongoing changes in land use and ecological environments. This reciprocal interaction between natural systems and human activities has collectively shaped the distinctive landscape of the Jianghan Plain.

In summary, the formation and transformation of these landscape features are the result of long-term synergistic interactions between natural factors and human activities. The climatic regime shaped by the Qinling Mountains and the evolution of Yunmengze lakes established the foundational landscape of the Jianghan Plain. From the Palaeolithic hunting and gathering period to contemporary industrial and urban development,

human participation across different historical stages—through settlement construction, agricultural production, hydraulic engineering, and cultural introduction — has continuously propelled the Jianghan Plain's landscape transformation from a primordial natural state toward a diversified modern form (Table 6).

Historical Period	Landscape Features	Human Activities
Palaeolithic Age	The original natural landscape predominates, primarily existing in a stage of natural evolution, with forests, rivers, lakes, and other components forming the basic ecological systems.	Human activities primarily centred around hunting and gathering, with limited territorial expansion, resulting in minimal impact on the natural landscape.
Neolithic Age	The emergence of primitive agricultural and settlement landscapes marks the beginning of partial transformation of natural landscapes. Key characteristics include: 1. The area of rice paddies is relatively small and dispersed. 2. Settlements are in higher terrains that are less prone to flooding and are close to water sources, facilitating agricultural irrigation, such as in areas near hills and ridges. 3. Simple structures such as thatched houses and mud brick dwellings begin to appear. 4. Human settlements are sparsely distributed, exhibiting a dispersed settlement pattern. 5. The emergence of some larger settlements with functional zoning, resembling	1. The origin of agriculture is characterized by the cultivation of crops, primarily rice, with rice paddies in the early stages of development. The areas under cultivation are small and relatively scattered. 2. Settlements are chosen based on the suitability of the natural environment. 3. Simple constructions, such as thatched houses and adobe buildings, are built. 4. People begin to utilize natural resources for basic production and daily activities, leading to the formation of small-scale settlements that are dispersed, reflecting a pattern of scattered habitation. 5. Centralized settlements of a certain scale and functional zoning are established. Basic hydraulic

	early forms of cities. 6. Certain large central settlements feature water management infrastructure, such as dams and sluices.	infrastructure, such as dams and sluice gates, is constructed to address issues of flooding and drought.
Bronze Age	1. The scale of settlements expanded, resulting in the widespread distribution of both large and small urban centres as well as dispersed settlements. 2. Certain cities, such as Ji'nan City, served as the capital of the Chu State and demonstrated more effective water management, enabling the mitigation of flooding and the provision of water for daily use by residents. 3. The area of arable land gradually increased, accompanied by the emergence of small irrigation channels and other agricultural water conservancy facilities, which enhanced the stability of agricultural production. 4. The appearance of palaces, elevated platforms, royal gardens, and other landscape features contributed to the diversification and enrichment of the built environment.	1. Human populations gradually migrated further into the plains. 2. Agricultural production techniques improved. 3. Large scale agricultural irrigation infrastructure was developed. 4. Urban construction and management were advanced.
Qin Dynasty to Yuan Dynasty	1. The natural landscape of the Jianghan Plain has undergone significant changes, with alterations to its water systems. The main body of the Yunmengze lake cluster has been compressed, and the lake surface fragmented, presenting a fragmented appearance. The plain has expanded eastward, while the lakes have contracted	1. The government oversees the construction of large-scale hydraulic engineering projects (such as the Jingjiang Levees), while private individuals extensively build smaller water management infrastructure (such as ponds and wells). Farmers construct dikes, reclaim land, and build embankments for agricultural production.

	toward the southeast. 2. The settlement density has increased compared to the Bronze Age. 3. Urban defensive structures have been enhanced. 4. Buddhist landscapes, such as temples and pagodas, have emerged.	2. Multiple waves of population migration occur as a result of warfare, leading to an increase in the number of settlements. 3. The construction of defensive structures for towns and cities is undertaken. 4. Religious buildings are constructed.
Ming Dynasty to Qing Dynasty	1. Unique paddy field agricultural landscapes. 2. Intensification of flood and waterlogging disasters. 3. Diverse settlement patterns (including peripheral dispersion, low-lying water towns, and riverbank towns). 4. Planned settlements with diversified architectural styles.	1. Significant influx of immigrant populations. 2. Reclamation of wasteland and creation of farmland through lake enclosure. 3. Construction of hydraulic engineering projects. 4. Advancement of agricultural production.
Modern and Contemporary Period	1. Most rural areas in the Jianghan Plain exhibit a settlement pattern centred on traditional agriculture, characterized by paddy fields. 2. The concessions feature a distinctive architectural landscape, blending European, Chinese, and Sino-Western styles.	1. The introduction of Western culture led to the establishment of commerce and industry in key riverside cities such as Wuhan and Shashi, transforming them into significant trade centres. 2. The construction of factory buildings and the establishment of trade ports were carried out.
After 1949	1. The overall landscape transformation is predominantly characterized by urban and industrial landscapes. 2. Agricultural land is increasingly organized into standardized, modular layouts, reflecting a shift from traditional to modern agricultural landscapes. 3. The emergence of high-rise buildings, modern factories,	1. The advancement of industrialization and urbanization in China has led to significant changes in the landscape of the Jianghan Plain. 2. The mechanization, scaling-up, and specialization of agricultural production represent human-driven efforts to transform agricultural practices. 3. The accelerated development of urban and rural areas, including the construction of high-rise buildings

	and other urban landscapes in cities. 4. Rural landscapes are gradually adopting modernized characteristics.	and factories, exemplifies human construction activities. 4. Addressing and transforming emerging issues related to the natural environment and human activities requires targeted solutions and interventions.

Table 6. A comparative table of the Landscape Features and Human Activities in the Jianghan Plain across different historical periods. (Source: created by the author)

In *The Making of the English Landscape*, Hoskins proposed the theory of 'landscape as historical text' and the framework of 'historical stratification', [418] which provides a classical paradigm for combining space and history in the study of landscape formation in China. Through the decoding of material landscapes, Hoskins established a 'landscape-history' intertextual relationship, highlighting the continuity between technological progress and social transformation. His 'stratification' framework, based on English experience, emphasizes the persistence of these processes, yet it is imbued with a linear historical perspective and a tendency toward text-centeredness. As such, it cannot be directly applied as a universal model to the landscape of the Jianghan Plain or to landscape studies in China. Rather, it serves as a starting point for methodological dialogue. In the case of the Jianghan Plain, located in the middle reaches of the Yangtze River, the core characteristic of its landscape lies in the institutional practices and ecological adaptations driven by 'water control civilization'. Its evolutionary logic is rooted in the ongoing interplay between state governance needs and local survival strategies, revealing a pattern of discontinuous reconstruction driven by administrative authority (such as the Ming and Qing restrictions on levees and modern policies of land reclamation). This stands in contrast to the gradual, market-driven evolution of the English landscape. However, it is evident from the research process that human activities play a key role in landscape formation, which resonates with Hoskins' observations. Both approaches emphasize that landscapes evolve in tandem with human

[418] W. G. Hoskins, *the making of the English landscape*, (Dorset: Little Toller Books, 2014).

technological advancements, social organization, and cultural exchange, and both highlight the role of cultural factors in shaping landscape diversity.

In the study of the landscape evolution of the Jianghan Plain, the effective integration of research methods is crucial. On the one hand, a multidisciplinary approach is needed, combining theories and methods from archaeology, history, geography, ecology, and architecture. Archaeology, through site excavations, reveals traces of ancient human activities and reconstructs historical scenes. History, through textual analysis, traces major events and landscape changes across different periods. Geography, by examining topography, landforms, and the evolution of water systems, provides insights into natural environmental changes. Ecology focuses on the dynamic evolution of ecosystems, while architecture examines the development of building styles and settlement forms. On the other hand, modern technological tools, such as Geographic Information Systems (GIS) and Remote Sensing (RS), can be employed for dynamic monitoring and spatial analysis of topography, land use changes, and landscape transformation. Archaeological techniques like radiocarbon dating and pollen analysis contribute to precise dating and understanding of historical periods and ecological environments. Additionally, a combination of field surveys and archival research is essential, with field investigations of current natural landscapes, historical sites, and traditional architecture, corroborating and enriching documentary evidence. Case studies of specific historical periods and regions, compared with similar areas, will help reveal the underlying patterns of landscape evolution in the Jianghan Plain in a more comprehensive and nuanced manner.

In the study of the historical landscape evolution of the Jianghan Plain, the effective integration of research methods is of paramount importance. On one hand, a multidisciplinary approach is essential, combining theories and methods from archaeology, history, geography, ecology, architecture, and other fields. Archaeology,

through excavation, reveals traces of ancient human activities and reconstructs historical scenes. History, relying on literature and classical texts, traces significant events and landscape changes across different periods. Geography analyses natural environmental changes from the perspectives of terrain, landforms, and water systems. Ecology focuses on the dynamic evolution of ecosystems, while architecture examines the development of building styles and settlement forms. On the other hand, modern technologies such as Geographic Information Systems (GIS) and Remote Sensing (RS) play a critical role in dynamic monitoring and spatial analysis of terrain, land-use changes, and environmental transformations. Techniques like carbon dating and pollen analysis in archaeological excavations provide precise dating and ecological context. Furthermore, combining field surveys with literature research enables cross-validation by examining existing natural landscapes, historical sites, and traditional architecture, and comparing them with textual records. Case studies of typical historical periods and regions, along with comparative analyses of other similar areas, help to reveal the underlying principles of landscape evolution in the Jianghan Plain more comprehensively and deeply.

By integrating these methods, an explanatory model of 'institutional change - human-environment interaction - landscape transformation' is developed. This model not only extends the interdisciplinary and long-term methodological core of Hoskins but also innovates by addressing the distinctive features of Chinese landscapes, such as institutional drivers and collective memory diversity. This makes the Jianghan Plain a valuable field for testing cross-cultural theoretical adaptations and contributes a 'Chinese toolbox' to the global field of landscape history.

The research findings indicate that the making of the Jianghan Plain landscape is the result of a long-term interaction between human activities and the natural environment.

Its evolution follows a pattern of 'adaptation – transformation – reshaping – protection', which has had profound impacts on both the ecological environment and cultural heritage. In terms of ecological environment, the landscape's evolution has led to significant changes in the ecosystem, from a pristine natural system to an anthropogenically influenced agricultural and urban ecosystem. Activities such as land reclamation around lakes have drastically reduced wetland areas, diminished biodiversity, altered water system morphology, and affected the region's hydrological regulation functions. These changes have increased the risk of natural disasters such as floods and droughts, while prolonged agricultural activities have also exerted pressure on the soil environment. In terms of cultural heritage, landscape evolution has preserved rich material cultural heritage, including ancient settlement sites, urban structures, and water management projects. It has also fostered numerous forms of intangible cultural heritage, such as folk culture and traditional craftsmanship related to agriculture and daily life. However, the rapid transformation of landscapes has endangered some cultural heritage, which faces threats from natural erosion, human destruction, and interruptions in inheritance. At the same time, the unique landscape evolution process has created culturally distinctive landscapes, such as the polder field farming landscape and water town settlements, which embody local wisdom and memory. These landscapes serve as both valuable cultural treasures and important resources for cultural preservation and tourism development, requiring a balance between protection and sustainable utilization.

Regarding related issues, although climate change was not a primary focus of the study, fluctuations in climate during historical periods may have influenced water system changes in the Jianghan Plain. Future research should integrate paleoclimate data to better quantify the synergistic effects between climate and human activities. The polder landscape of the Jianghan Plain shares similarities and differences with agricultural systems in other southern Chinese water towns (e.g., terraced fields, sand fields, and

lake fields), and this study can provide case support for regional landscape comparisons. Additionally, historical ecological crises triggered by overexploitation offer valuable lessons for contemporary ecological conservation and land-use planning.

Conclusion

The development of the landscape in the Jianghan Plain initially stemmed from natural evolution, with early human inhabitants adapting to their environment. During the early Neolithic period, humans began to establish primitive settlements and engage in rudimentary agricultural practices. By the late Neolithic period, centralized settlements emerged, alongside the construction of small-scale water dams. In the Bronze Age, various towns and distribution centres appeared, and urban areas began to feature rudimentary water systems, alongside an expansion of agricultural lands.

From the Qin to the Yuan dynasties, significant changes occurred in the natural environment, prompting the government to undertake large-scale hydraulic engineering projects, while local communities constructed ponds and wells. During this period, farmers initiated embankment and land reclamation efforts, further advancing agricultural practices.

The Ming and Qing dynasties marked a crucial transformation, characterized by a continual increase in population and denser settlements, leading to the emergence of town-like forms. Large-scale land reclamation projects were implemented around lakes, with a network of embankments creating a distinctive polder fields landscape, establishing the region as one of China’s primary grain-producing areas.

In modern times, much of the rural areas in the Jianghan Plain have retained a traditional agricultural settlement model based on polder fields. However, in contemporary times, urban and industrial landscapes have begun to dominate, resulting in the industrialization and modularization of agricultural production, while rural landscapes gradually exhibit modern characteristics.

In the Jianghan Plain, human inhabitants have evolved from merely adapting to nature to increasingly modifying it. Initially, they lived in dispersed settlements on elevated hills and ridges. Over time, these settlements became more concentrated, eventually leading to the establishment of towns. Human habitation progressed along natural waterways, gradually moving from the periphery towards the interior of the plain until reaching its central regions. This developmental trajectory involved a step-by-step approach to land cultivation, beginning with small-scale rice paddies, evolving into polder fields, and progressing to modern, mechanized, modular farmland. Today, comprehensive urbanization is transforming the landscape, with rural areas beginning to exhibit characteristics of modernization.

The research conducted in the Jianghan Plain region has yielded significant results, demonstrating the effectiveness of the employed methodologies. However, the evolution of landscape features in the Jianghan Plain follows specific developmental patterns and possesses distinct characteristics: when applying these methods to study other regions in China, it is essential to take into account the regional differences and particularities to avoid indiscriminate application.

While existing studies have made substantial contributions to the landscape research of the Jianghan Plain, several limitations remain. Theoretically, although the Hoskins framework has been adapted to construct a new interpretive model, research on

institutional practices under the ‘water control civilization’ predominantly focuses on macro-level analysis. It lacks granular exploration of how micro-social groups engage in landscape formation within institutional frameworks, as well as the role of inter-group interest dynamics in shaping landscape evolution. Additionally, cross-cultural theoretical adaptation remains insufficiently nuanced, particularly in comparative analysis of divergent logics of landscape evolution between China and the West. The study does not fully interrogate the deeper social, economic, and cultural determinants of English landscape theory that inform its theoretical characteristics, thereby limiting the new model's generalizability.

Methodologically, while multidisciplinary approaches have been employed across various fields, integration depth varies. For instance, archaeological and ecological analyses of human-environment interactions in ancient contexts suffer from inadequate coordination in data integration and analytical methodologies. Modern technical tools excel at capturing macro-level landscape changes but are less effective in documenting and analyzing micro-scale elements, such as traditional architectural details or the structural evolution of small-scale water conservancy infrastructure. Field surveys are constrained by spatial and temporal limitations, potentially overlooking landscape features in remote areas of the Jianghan Plain. Historical documentation research may also be compromised by gaps in records or interpretive biases, affecting the accuracy of landscape evolution reconstruction.

In applying the 'institutional change - human environment interaction - landscape transformation’ model, the study underrepresents the dynamic mechanisms of institutional change, neglecting external influences such as international environmental shifts and technological diffusion on China's institutional and landscape evolution. Human-environment interaction analysis is largely historically situated, with limited

attention to contemporary transformations under urbanization and globalization—such as demographic mobility and cultural impacts on landscape change. Syntheses of landscape evolution patterns emphasize long-term macro-trends but lack detailed explanations for variances in tempo and intensity across historical periods.

Regarding ecological and cultural heritage impacts, the study lacks systematic assessment of landscape evolution's long-term ecological effects, hindering predictive modeling of future environmental trends. Cultural heritage research primarily describes the current state of tangible and intangible assets, while mechanisms for reconciling conservation imperatives with modern landscape development remain underexplored. Few actionable solutions have been proposed, limiting the study's practical guidance for sustainable landscape management.

In conclusion, this research offers twofold scholarly value. First, it traces the millennia-long trajectory of landscape evolution in the Jianghan Plain, identifying period-specific drivers and elaborating on the dialectical relationship between human activities and natural environments. By providing a Chinese case study, it addresses gaps in longue durée landscape research for Chinese geographic regions. Second, it adapts Hoskins' historical landscape methodology to Chinese contexts, offering a 'Chinese approach' to global landscape historiography through the Jianghan Plain case. The refined methodology of integrating archival research with on-site investigation provides a robust framework for future Chinese academic inquiries.

Suggestions and Recommendations for Future Research

This PhD research project presents a systematic investigation of the landscape

development history of the Jianghan Plain, yielding significant findings. The landscape development history of the Jianghan Plain represents the interplay between natural processes and human activities, as well as the history of cultural transmission and innovation. By examining this landscape development history, we can gain a deeper understanding of the relationship between humanity and nature, providing valuable insights for achieving sustainable landscape development. However, this research also has certain limitations that need to be addressed and refined in future studies.

This study encompasses a lengthy historical period, so the analysis of certain specific historical phases may lack depth. Notably, the collection of data for some remote regions or particular historical periods poses significant challenges, and the impact of specific historical events on the landscape may be difficult to analyse comprehensively due to a scarcity of available data. This research primarily focuses on the Jianghan Plain region, and given its unique regional development, it may not fully represent the overall landscape development of China. In terms of methodology, although a variety of approaches have been employed, most of these methods exhibit limitations during their application, necessitating further innovation and refinement.

Future research can further expand the scope and depth of this study. Temporally, it can delve deeper into the landscape development of the Jianghan Plain during specific historical periods. Additionally, the time frame of the research can be extended to encompass earlier historical periods, thereby enhancing our understanding of the origins and evolution of the Jianghan Plain's landscape. Spatially, the research scope can be broadened to include other regions of China, facilitating comparative studies of landscape development across different areas. By examining the differences in natural environments, human activities, and cultural heritage among various regions, we can gain a more comprehensive understanding of the diversity and complexity of landscapes in China.

In terms of research methodology, future studies could further expand the sources of literature by including non-official documents, such as folk literature and inscriptions, to address the limitations of official records. Digital technologies can be employed to organize and analyse literature, utilizing text mining techniques to extract key information from extensive datasets, thereby supporting research efforts. Employing methods of textual criticism and analysis can help to evaluate the authenticity and reliability of the documents, enhancing the accuracy of the research, and strengthening collaboration with local governments and communities is recommended to secure their support and cooperation, which would facilitate the investigation during field studies.

The study of the making of the Chinese landscape is a long-term and complex endeavour that requires continuous exploration and innovation. Research into the landscape development history of the Jianghan Plain not only provides historical reference and theoretical support for the broader context of landscape development in China but also highlights the limitations of current research methodologies, thereby indicating directions for future studies. It is anticipated that future research will contribute to a more comprehensive and in-depth understanding of the evolution of landscapes in China, thus playing a crucial role in the coordinated advancement of ecological preservation and cultural heritage conservation.

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