



THE STUDY OF DAUR SETTLEMENT SPACE TO DESIGN THE CULTURAL
MODEL FOR SUSTAINABLE DEVELOPMENT AND PROTECTION: CASE
STUDY OF DAUR ERMENQIN VILLAGE



By
Mrs. Yina QIAO

A Thesis Submitted in Partial Fulfillment of the Requirements
for Doctor of Philosophy Culture - Based Design Arts
Silpakorn University
Academic Year 2025
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In 2023, Ermenqin Village in Heilongjiang Province was listed as one of China's sixth batch of key protected ethnic minority villages. The local government built a museum and homestays featuring Daur architectural styles. However, due to insufficient cultural content development and high heating costs, these facilities have not been sustainably operated, revealing a gap between policy implementation and cultural sustainability.

This study takes Ermenqin Village as a case to explore the sustainable development and cultural preservation model of Daur settlements. The research aims to: (1) extract the cultural wisdom embedded in traditional Daur settlement spaces; (2) construct a cultural model that connects dwelling, rituals, and daily life order to promote cultural inheritance and continuity; and (3) propose a sustainable development framework that meets the development needs of Ermenqin Village.

A mixed-methods approach was adopted. The qualitative methods include in-depth interviews, participatory observation, and literature analysis, while the quantitative methods involve surveys and data analysis. Three design experiments were conducted: Developing the "Cultural Recognition–Dissemination–Development (CRD)" model summarizing Daur settlement wisdom; Constructing a physical settlement model and an online digital exhibition hall; And proposing a sustainable development model integrating cultural, social, and economic dimensions.

These findings highlight that digital communication can effectively enhance the public visibility of Daur culture and promote the economic development of Ermenqin Village. From a theoretical perspective, this study provides a sustainable cultural model for the protection of ethnic settlements. From a practical perspective, it provides a feasible path for the development of ethnic minority villages under the background of the national policies on rural revitalization and cultural protection.

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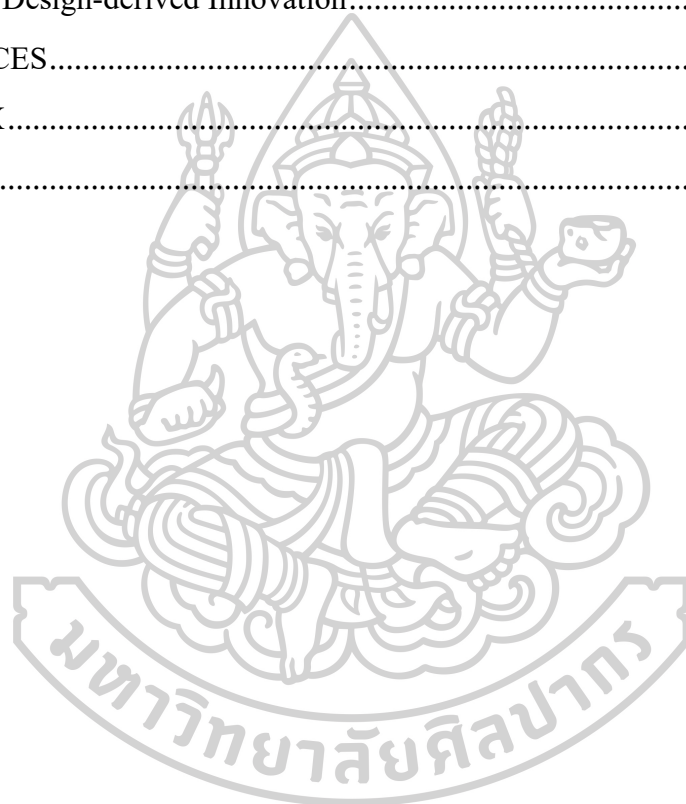
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CHAPTER 1

INTRODUCTION

1.1 Statement and significant of the problems

In the context of global sustainable development, traditional villages are recognized as vital components of cultural heritage that preserve humanity's collective memory. These communities hold immense historical, cultural, and social value while remaining irreplaceable. However, with accelerating globalization and urbanization, many villages now face critical challenges such as population decline, functional obsolescence, and spatial pattern deterioration. As a result, the preservation and revitalization of traditional villages have become major concerns for both the international community and academic circles.

In China, to address the severe problem of the rapid disappearance of traditional villages, the government launched the National Traditional Village Survey and Catalog Protection System in 2012. As of March 2023, the sixth batch of China's traditional village catalog had been released, adding 1,336 villages. In total, 8,155 villages nationwide have been included in the national protection catalog, forming the largest and most comprehensive agricultural civilization heritage protection system to date. This demonstrates not only the high level of national commitment to the preservation of traditional villages but also provides institutional safeguards for protecting ethnic minority settlements.

Within this framework, the cultural value of Daur ethnic settlements has gained national recognition. The inclusion of villages such as Hala New Village and Ermenqin Village in the Meilisi Daur Autonomous District of Qiqihar, Heilongjiang Province, marks a new stage in the preservation of ethnic settlements in Northeast China—one that requires both urgent attention and dynamic renewal. Taking Ermenqin Village as a case study, it not only preserves the historical and cultural memory of the Daur people and their spatial wisdom but also faces multiple challenges, including functional decline, population outflow, and difficulties in maintaining cultural continuity. Therefore, exploring how to restore regional vitality while safeguarding cultural heritage has become an urgent practical issue.

The Daur people are one of China's smaller ethnic groups. According to the Seventh National Population Census (2020), their population is 131,900, accounting for approximately 0.0094% of the national total. The group is mainly distributed in the Morin Dawa region of Hulunbuir, Inner Mongolia, and the Meilisi region of Qiqihar,

Heilongjiang, with smaller populations in the Yili and Tacheng regions of Xinjiang. Some Daur communities also reside across the Russian border in the Shilka River and Boli regions. As descendants of the Khitan Great Khara clan (Meng, 2000), the Daur people represent the only ethnic group within the northern nomadic and hunting culture belt that transitioned into a sedentary lifestyle. Over more than 800 years of historical evolution, they have developed a distinctive cultural system and wisdom in architecture, religion, art, literature, and other fields.

However, with modernization and lifestyle transformation, the spatial patterns of Daur settlements have become increasingly fragmented. Traditional cultural characteristics have gradually weakened amid intermarriage, population mobility, and social change—particularly visible in language, art, and residential architecture. On one hand, the Daur people still lack a written language, and their cultural inheritance primarily depends on oral traditions and folk artists. As older generations pass away, the transmission of linguistic and artistic culture faces serious threats. On the other hand, traditional residential clusters have almost disappeared, replaced by modern houses that abandon ethnic spatial wisdom and weaken cultural identity. Younger generations are increasingly detached from their ethnic culture, and external cultural communication has become more difficult.

Moreover, Daur settlements are mostly located in remote and cold northern regions, far from national political and economic centers. Winter temperatures can drop to -40°C , with severe natural conditions compounded by geographic isolation and limited infrastructure. The overall economic level remains relatively underdeveloped, posing significant challenges for generating sustainable livelihoods. Therefore, the preservation and revitalization of traditional Daur settlements are not only essential for cultural heritage transmission but also critical for promoting regional socio-economic sustainable development.

Based on this background, this study takes Ermenqin Village as a case to explore a sustainable development model for cold-region ethnic minority settlements—one that balances cultural heritage preservation, the continuation of ethnic memory, and the reconstruction of regional vitality. This research not only responds to the global sustainable development agenda but also serves as a concrete practice in implementing China's "Rural Revitalization Strategy." It holds both theoretical value and practical significance for promoting ethnic cultural preservation and strengthening regional development resilience.

1.2 Objective of research

In order to address the above research questions, this study has three

Research objectives:

1. To study and identify the cultural genes of Daur settlement spaces, systematic surveys and the collection of historical materials will be conducted, along with the establishment of a database to document this gradually disappearing cultural heritage.
2. To analyze the cultural functions of Daur settlement spaces and the thermal advantages of traditional dwellings, in order to explore their implications for sustainable development.
3. To design the Ermenqin Sustainable Model that integrates Daur traditional wisdom with modern needs, promoting cultural transmission, community cohesion, and local development.

1.3 Hypothesis

The core hypothesis of this study is that through systematic analysis of the spatial wisdom of Daur settlements, it can be transformed into a sustainable cultural model with both cultural inheritance and social and economic development.

1. It is assumed that traditional dwellings not only show superior living performance but also have the spatial value of carrying cultural functions.
2. It is assumed that the research results will promote the formation of a cultural function model to enhance the visibility of national culture, strengthen community cohesion, and promote the participation and development of local socio-economy.
3. In the end, this study aims to build a cultural sustainable development model, achieve a balance between cultural inheritance, environmental adaptation and local development, and provide academic value and practical reference for the protection and revitalization of coldland ethnic minority settlements.

1.4 Scope of the Study and limitations

1.4.1 Content Scope

This study focuses on a comprehensive analysis of the Daur settlements by addressing multiple dimensions:

1. The spatial structure characteristics of Daur settlements, including site selection, layout, and architectural style;

2. Cold-climate adaptive techniques embedded in traditional residential architecture, which reflect ecological wisdom.

3. The symbolic meanings and functional divisions of cultural spaces, including ritual areas, gathering places, and residential zones.

4. The construction of a cultural model that integrates sustainable development with heritage protection.

5. The design of cultural models for dissemination and tourism development, contributing to the visibility and vitality of Daur culture in contemporary society.

1.4.2 Stakeholder Scope

The research primarily engages the Daur ethnic group while also involving stakeholders directly and indirectly related to cultural preservation and dissemination. These include:

1. Primary research subjects: villagers of different age groups, cultural inheritors, residential building craftsmen, and village cadres/management personnel.

2. Secondary research subjects: tourists and visitors, universities and academic researchers, as well as practitioners of cultural–tourism integration.

1.4.3 Area Scope

The geographical focus of this study is narrowed to the Daur settlement area within Meilisi Daur District, Qiqihar City, Heilongjiang Province, which is China's only prefectural-level district designated for the Daur ethnic group (note: Meilisi District is the sole city district named specifically for Daur people)

Among the villages in the district, Ermenqin Village of Woniutu Town is a key national-level traditional village designated for preservation, yet its physical and intangible cultural heritage shows pronounced degradation

Despite its relatively high Daur population, Ermenqin Village's traditional settlement culture remains inadequately preserved. Therefore, Ermenqin Village is selected as the primary case study, reflecting both the urgency of cultural preservation and the opportunity for designing site-specific protection strategies.

1.4.4 Time Scope

The study traces the evolution of Daur dwellings through three major migrations:

The 1220s – migration from the Ta'er River basin;

The mid-17th century – relocation to the Heilongjiang River basin;

The 1656s – settlement in the Nenjiang River basin.

Focus is placed on the late 17th-century Ma-Jia (Wuruge) house, which represents the most complete stage of Daur cultural and spatial development. Based on this, the study examines the Daur settlement cultural system after the third migration, covering the period 1956–2025 with Wuruge Settlement (Ermenqin Village) as the main case.

After the third migration, Daur settlements evolved from riverside nomadic clusters to stable courtyard villages, later forming linear and semi-clustered layouts along farmlands and rivers. In the 21st century, they have taken on modern rural spatial forms, reflecting both traditional continuity and adaptation to contemporary development.

1.5 Assumption

This study assumes that the core cultural genes embedded in Daur settlement spaces constitute the Independent Variables (IV). These include spatial organization, architectural form, and symbolic elements, which collectively shape the settlement's identity and resilience.

The Control Variables (CV) refer to the contextual conditions that influence and constrain the manifestation of these cultural genes. They include the natural environment (such as climate and geography), historical background, social and economic conditions, and population structure. These variables form the contextual framework within which cultural values are expressed and transformed.

The Dependent Variable (DV) is defined as the cultural values reflected and transmitted through spatial patterns and architectural practices. These values are embodied in processes of sustainable development and digital design, representing both the continuity of cultural traditions and their adaptation to contemporary development contexts.

The Outcome of this research is to establish a comprehensive framework linking cultural genes to their spatial and functional expressions. The outcomes include:

1. Cultural gene identification – recognizing and defining the core cultural features of Daur settlements;
2. Cultural model construction – translating these features into an operational

cultural framework.

3.Sustainable development – proposing culturally grounded strategies for regional revitalization.

4.Heritage protection practice – applying the model to guide the preservation and renewal of Daur settlement culture.

In summary, this conceptual framework assumes a dynamic relationship in which independent variables influence dependent variables under the conditions of control variables, ultimately leading to the defined outcomes. This relationship integrates cultural analysis with practical approaches for sustainable development and heritage protection.

1.6 Limitation of study

Despite the systematic approach adopted in this study, certain limitations must be acknowledged to ensure academic transparency and to contextualize the interpretation of the findings:

1. Limitations of Materials and Literature

The Daur people possess relatively few written records, and their cultural knowledge has been predominantly transmitted through oral tradition. This reliance on oral inheritance constrains the availability of verified documentary sources, leading to potential gaps in historical accuracy and scholarly interpretation. Consequently, the reconstruction of cultural models may be influenced by the subjectivity of oral accounts and the scarcity of archival evidence.

2. Case Scope Restriction

The research is primarily focused on Ermenqin Village in Meilisi Daur District, which, although significant, cannot fully represent all Daur settlements distributed across Heilongjiang, Inner Mongolia, and Xinjiang. The findings therefore may not be universally generalizable to the entirety of Daur cultural spaces but rather should be regarded as a case-specific framework that requires adaptation when applied to other contexts.

3. Methodological Constraints

The methodology integrates interviews, physical modeling, and digital exhibitions. However, such a multi-method approach may encounter consistency challenges. Differences in participant perspectives, technological limitations, and the

subjective interpretation of qualitative data could generate discrepancies across datasets. This methodological complexity increases the difficulty of ensuring reliability and replicability.

4. External Uncontrollable Factors

Several factors lie beyond the researcher's control, including urbanization, climate change, and state-level policy adjustments. These external dynamics may accelerate cultural erosion, reshape settlement patterns, or alter resource allocation for heritage protection, thereby impacting the practical implementation of the study's recommendations.

1.7 Definition

To clarify the conceptual framework of this study, the key variables and outputs are defined as follows:

1. Independent Variable (IV): The Daur People

The Daur is one of China's officially recognized ethnic minorities, mainly residing in Heilongjiang, Inner Mongolia, and Xinjiang, and historically connected to the Khitan. They have developed adaptive strategies for cold climates, supported by unique social structures and cultural traditions. Their roles include the oral transmission of cultural memory, knowledge of vernacular architecture, ritual practices, and the provision of community feedback. These elements constitute the core cultural genes embedded in settlement practices.

2. Control Variable (CV): Ermenqin Village

As a representative settlement in Heilongjiang Province, Ermenqin Village preserves elements of traditional Daur dwellings and has been listed among the sixth batch of nationally protected traditional villages. However, its preservation faces challenges due to modernization pressures. As a case study, Ermenqin Village functions as the contextual condition of this research: it provides empirical data, demonstrates traditional wisdom under modern development contexts, and serves as the geographical anchor for cultural analysis.

3. Dependent Variable (DV): Settlement Space

Settlement space is regarded as both a research object and a cultural carrier. It represents the spatial logic through which cultural values are expressed and transmitted in patterns of site selection, layout, and architecture. Within this study, settlement space

reflects cultural values through design paradigms such as sustainability, system orientation, and participatory practices. It therefore provides insights into the cultural logic of Daur settlements and implications for village design under contemporary development.

4. Output: Cultural Model

The final output of this research is the construction of a cultural model that achieves a balanced integration of environmental adaptation, cultural transmission, and socio-economic development. Rooted in heritage but oriented toward the future, this model aims to provide expert guidance for rural revitalization, inform policy applications, support heritage protection practices, and create pathways for cultural dissemination and tourism development.

1.8 Expected Output and Outcome

The expected benefits of this research can be categorized into four dimensions—Environment (E), Social Culture (S), Governance & Justice (G), and Balance (Equity & Integration). These dimensions highlight the multidimensional value of constructing a sustainable cultural model for Daur settlements.

1. Environmental Benefits (E)

Eco-efficiency: Promoting low-energy and environmentally friendly settlement designs adapted to cold regions.

Local materials: Encouraging the use of indigenous building resources such as timber, soil, and reed grass, thereby reducing ecological costs.

Climate resilience: Enhancing the adaptive capacity of settlements to extreme seasonal variations, ensuring sustainable living conditions.

2. Social and Cultural Benefits (S)

Cultural identity: Reinforcing the recognition and pride of the Daur community in their heritage.

Heritage transmission: Safeguarding intangible cultural heritage, including rituals, craftsmanship, and oral traditions.

Community cohesion: Strengthening intra-community bonds and intergenerational cultural continuity through shared spaces and practices.

3. Governance and Justice (G)

Policy support: Providing research-based insights to inform heritage preservation and rural revitalization policies.

Rural revitalization: Contributing to local economic development through cultural tourism and sustainable settlement planning.

Fair participation: Ensuring inclusive stakeholder engagement, giving voice to villagers, cultural inheritors, and practitioners in decision-making processes.

4. Balance (Equity & Integration)

Tradition–modern fusion: Integrating traditional spatial wisdom with contemporary design practices.

Culture–development harmony: Achieving equilibrium between cultural preservation and socio-economic growth.

Sustainable model: Establishing a replicable framework that balances cultural heritage, environmental adaptation, and development needs.

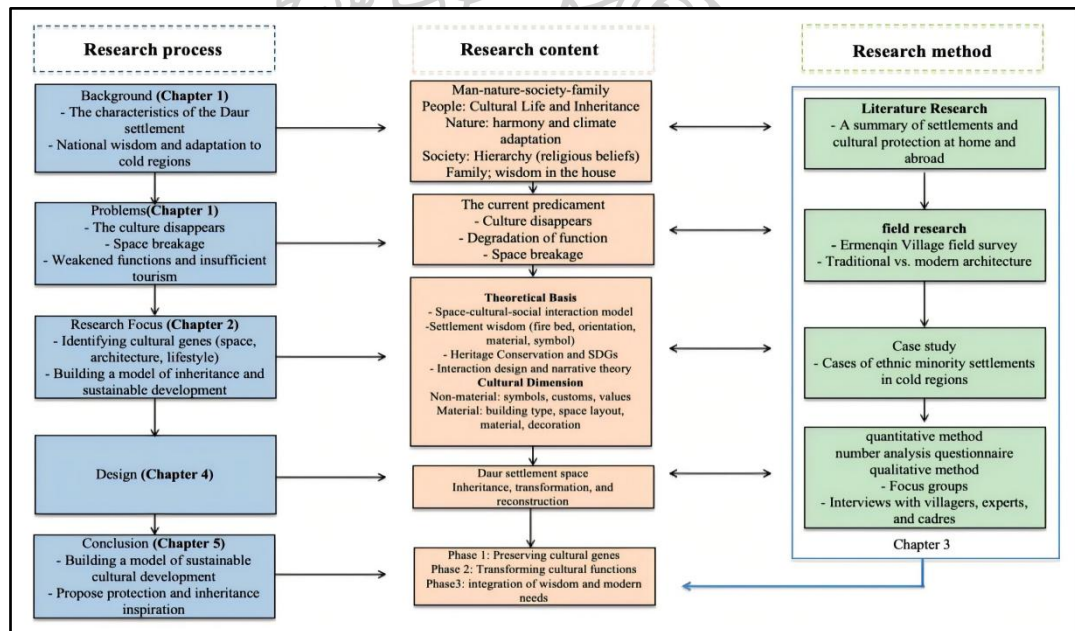


Figure 1 Research Framework

CHAPTER 2

LITERATURE REVIEW

In the context of sustainable global development, the preservation and revitalization of traditional settlements have become a critical academic and practical concern. These settlements are not merely physical spaces but also vital carriers of cultural memory and ecological wisdom, embodying the outcomes of humanity's long-term coevolution with nature. However, under the accelerating forces of modernization and urbanization, many ethnic minority settlements are confronting severe challenges, including population decline, spatial degradation, and cultural erosion. The case of the Daur people—one of China's smaller ethnic groups—exemplifies this predicament.

Through centuries of adaptation to the harsh climatic conditions of northern China, the Daur people have cultivated a distinctive body of settlement wisdom. Their traditional dwellings, spatial configurations, and communal practices illustrate a delicate equilibrium between ecological adaptation, social organization, and cultural expression. Yet, with the rapid transformation of society, this wisdom is increasingly endangered: traditional architectural forms are disappearing, the continuity of cultural heritage is weakening, and collective identity is fragmenting. This situation highlights the urgent necessity of systematically studying and preserving the cultural logic embedded within Daur settlement spaces.

Accordingly, this chapter pursues a dual objective. First, it systematically traces the developmental trajectory of Daur settlements from the perspective of tangible and intangible cultural systems, revealing the evolution of spatial structure, architectural form, and cultural expression, while situating them within the broader framework of China's rural revitalization and cultural heritage conservation. Second, it adopts multidisciplinary perspectives—including narratology, sustainable development theory, and digital communication mechanisms—to construct an integrated analytical framework for understanding cultural inheritance and sustainable settlement development, thereby bridging traditional cultural logic with contemporary development

Furthermore, this chapter investigates the structural and expressive dimensions of Daur cultural systems, examining how cultural narratives, spatial configurations, and tangible carriers can be translated into systematic research models that inform sustainable development and heritage protection. Through comparative analysis of domestic and international case studies, combined with fieldwork in Ermenqin Village in Heilongjiang Province's Meilisi Daur Autonomous District, it reveals both the practical challenges and the opportunities that minority settlements face in balancing conservation with modernization. It demonstrates how local cultural intelligence can serve as a valuable reference for contemporary sustainable development strategies.

Ultimately, this chapter aims to provide a comprehensive theoretical and empirical foundation for subsequent research. It clarifies the historical significance, cultural value, and academic contribution of Daur settlements, thereby establishing a solid basis

for constructing a cultural model that supports the sustainable conservation and revitalization of ethnic minority settlements.

2.1 Overview of the Daur people

As one of China's smaller ethnic groups, the Daur people primarily reside in the northeastern border regions and northwestern Xinjiang, exhibiting a distribution pattern characterized by wide dispersion and small clusters (Peng, 1992). According to the Sixth National Population Census (2010), the total Daur population was 131,992 (Guo, 2007). Their major settlements are currently concentrated in the Morin Dawa Daur Autonomous Banner and the Ewenki Autonomous Banner of Inner Mongolia, the Meilisi Daur Autonomous District of Qiqihar City in Heilongjiang Province, and Tacheng County in Xinjiang (As shown in Figure 2).

Before the 17th century, the Daur people mainly inhabited the Jingqili River basin, located south of the Outer Khingan Mountains (now within Russian territory). In the mid-17th century, following the Russian invasion of the Heilongjiang River basin, the Daur—along with several neighboring ethnic groups—were forced to migrate, with most resettling in the Nenjiang River basin. Later, under Qing dynasty conscription policies, portions of the Daur population were relocated to towns along China's northeastern and northwestern frontiers, gradually forming the current distribution pattern of broad dispersion with localized clustering.



Figure 2 Distribution map of Daur

(Source: reproduction from national atlas of china,2025)

2.1.1 History of the Daur people

2.1.1.1 The First Migration of the Daur Ethnic Group

The term “Daur”, meaning “pioneers”, is the ethnic self-designation of the Daur people, first recorded between the late Ming and early Qing dynasties. Historical texts feature multiple phonetic variants such as Dahur, Da Hu’er, and Da Ur. Ethnological studies trace the Daur’s ancestry to the Meng clan of the Khitan tribe (Meng, Wang, & Lin, 2002), whose early settlements were located along the Taoyer River Basin (Wang, 2005). Traditionally, the Daur lived by hunting, herding, and fishing, wearing animal skins and adapting their livelihoods to seasonal environmental changes (Miao, 2020).

After the fall of the Liao Dynasty, the Daur leader Kulayir led the resistant Khitan remnants northward to the Genhe Mountains near the eastern tributaries of the Erguna River (Meng, 2018). Subsequent migrations of related Khitan groups culminated in their relocation to the upper Heilongjiang River region by the early 13th century, marking the formation of the Daur as a distinct ethnic group.

During the 13th–17th centuries, the Daur inhabited the Heilongjiang Basin (see Figure 50), a vast area extending from west of the Numan River to east of Lake Baikal, encompassing the Heilongjiang, Shireka, Erguna, and Jingqili Rivers. The landscape was characterized by “moderately elevated mountains with dense forests and grasslands in broad basins” (Soviet Academy of Sciences, 1956), known in Russian as the “Dauria Region” (Meng, 2018).

Over centuries of adaptation, the Daur developed water-oriented settlement systems along riverbanks and mountain-backed villages supported by forest and grassland resources. This adaptive strategy produced a distinctive regional settlement pattern integrating mountain, water, and grassland systems, forming the ecological foundation of Daur habitation that persists today.

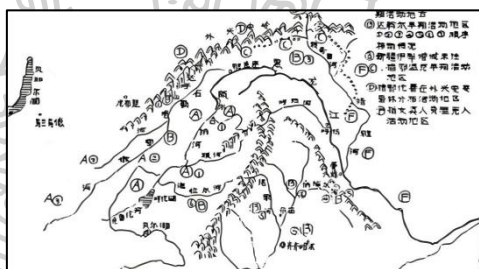


Figure 3 The distribution of the Daur people in the Heilongjiang River basin
(Source: A Brief History of the Daur People, 2024)

2.1.1.2 The Second Migration of the Daur Ethnic Group

During the 1640s, Russia’s eastward expansion fueled territorial ambitions for the Heilongjiang Basin’s rich natural resources, resulting in repeated incursions led by figures such as Boyakov. In response, the Qing government implemented the policy of “cutting off their food supply”, which indirectly prompted the Daur people to migrate southward in the mid-17th century.

The Daur eventually resettled along the Nen River and its tributaries—including the Nomor, Gan, and Nen Rivers—where they transformed riverbanks into fertile farmlands through large-scale reclamation efforts. Over time, they became the primary inhabitants of the Nen River Basin, establishing a stable agrarian lifestyle that replaced their earlier semi-nomadic existence.

Over the past three centuries, this region evolved into the second homeland of the Daur people. Historical records indicate that they originally founded

around 342 villages, of which 56 have since disappeared and 27 are now inhabited by other ethnic groups. Today, approximately 259 authentic Daur villages remain, mainly concentrated along the Nen River's middle and lower reaches (see Figure 51) (Wu, 2020).

This southward migration not only marked a major spatial and cultural reorganization but also established the ecological foundation for the Daur's adaptation to the cold-region agricultural system, shaping the settlement landscape that persists today.

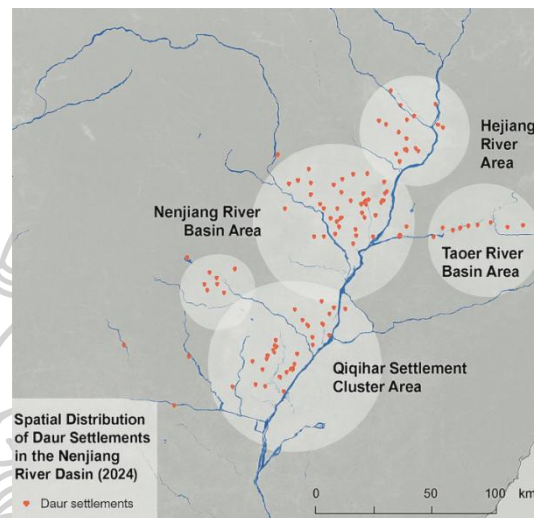


Figure 4 Distribution of settlements built by the Daur people in the Nenjiang River basin

2.1.1.3 The Third Migration of The Daur People

During the Qing Dynasty, the Daur people, renowned for their military discipline and agricultural expertise, were repeatedly conscripted by the imperial court to serve in frontier defense missions. Consequently, their population not only consolidated a major settlement zone along the Nen River Basin, but also expanded into northeastern and northwestern border regions, forming a multi-regional distribution pattern.

In the 1730s, approximately 730 Daur men and their families were relocated to Hulunbuir to cultivate land and perform garrison duties (Cheng, 2003). By the 1760s, to reinforce northwestern defenses, 500 Daur soldiers and 1,417 family members were transferred to Yili and Tacheng in Xinjiang (Meng, 2018). In the 1780s, another 3,500 troops, including 500 Daur soldiers, were stationed in E'su'litun, primarily engaged in agricultural reclamation (Jing, 2015).

The Daur descendants presently residing in Tacheng (Yili), Aihui District (Heihe, Heilongjiang), and Hulunbuir trace their origins to these historical

frontier garrison deployments between the 17th and 19th centuries. Their contributions were instrumental in advancing border consolidation and agricultural development in frontier regions.

Historical records indicate that through three major migrations, the Daur people developed a distinctive “large dispersion with small clusters” settlement pattern. Apart from these state-directed relocations, their primary settlements formed naturally around mountains, forests, farmlands, and grasslands, integrating agriculture, animal husbandry, and hunting into a human–nature interaction system. This process established the unique spatial logic that continues to define Daur settlement configurations today.

2.1.2 Overview of the Daur Culture

Through a long process of historical evolution, the Daur people have developed a distinctive cultural system characterized by the organic integration of political, economic, and cultural dimensions.

Politically, the Daur played a crucial role in frontier governance and military defense during the Qing Dynasty and later gained institutional recognition and regional autonomy under the ethnic policies of modern China.

Economically, leveraging the natural resources of the Heilongjiang River Basin, the Daur established a composite livelihood model integrating agriculture, animal husbandry, fishing, and hunting, demonstrating strong ecological adaptability to the cold northern environment.

Culturally, they have preserved a rich system of ethnic expression, reflected in language inheritance, Shamanistic beliefs, ancestral worship practices, and traditional festivals. These cultural manifestations not only embody the nation’s collective identity and worldview but also highlight their adaptive continuity amid changing socio-historical contexts.

2.1.2.1 Political Dimensions of Daur Culture

The political culture of the Daur ethnic group holds both historical depth and contemporary significance. Since the Qing Dynasty, the Daur have been gradually integrated into the imperial governance system, becoming an essential force in frontier administration and military defense.

In the Qing military-administrative structure, the Daur were incorporated into the Eight Banners System owing to their martial discipline and expertise in equestrian archery (Guo, 2007). This institutional inclusion not only conferred on them a distinct political status but also deeply embedded them within the national defense network. As Meng (2018) noted, the Qing court’s large-scale deployment of Daur garrisons in Heilongjiang, Nenjiang, and Mohe served dual purposes: securing borders and stabilizing agricultural production through military

settlements. This integration of military and agrarian functions established the Daur as a key pillar in northeastern frontier governance during the Qing period.

Moreover, the Daur played an irreplaceable role in ethnic migration and national unification. Between the 17th and 19th centuries, in response to the Qing policy of “cutting off their food supply,” large Daur populations migrated to the Nen River Basin and northwestern frontier regions (Meng, Wang, & Lin, 2002). These migrations, while fulfilling defense mandates, also fostered agricultural expansion and social stabilization in newly developed areas. The policy-driven relocation not only affirmed the Daur’s strategic military value but also reflected their embeddedness within the state’s political framework.

In contemporary China, the Daur’s political identity has been institutionalized under the system of regional ethnic autonomy. Following the founding of the People’s Republic of China, the Meilisi Daur Autonomous District was established in Qiqihar City, Heilongjiang Province, becoming the only Daur autonomous region in the nation (Jing, 2015). This administrative recognition not only affirms their political and cultural status but also provides institutional safeguards for the preservation of language, customs, education, and heritage.

Ultimately, the political culture of the Daur embodies an interactive logic of frontier ethnic governance. Within this dynamic, the Daur act both as recipients of state strategic directives and as active contributors to national consolidation and frontier development. This dual identity endows their political culture with profound historical significance and enduring contemporary relevance.

2.1.2.2 Economic dimension

As an independent ethnic group, the Daur people possess a distinctive clan-based social structure and internal economic system, while externally maintaining institutional affiliations with the central dynasties. This social subsystem exerts a subtle yet profound influence on their settlement patterns, reflecting a form of implicit socio-spatial interaction (Wu, 2020).

Agricultural Resources:The Daur people were among the earliest agricultural pioneers in the northern frontier of China. Migrating from the Heilongjiang River Basin to the Nen River Basin, they introduced advanced farming knowledge and techniques, thereby becoming recognized agricultural innovators.

The Nen River Basin, endowed with fertile dark-brown and black soils rich in organic matter, offered optimal conditions for cultivating soybeans, corn, fruit trees, and spring wheat. Leveraging these natural advantages, the Daur people enhanced traditional agricultural practices, introducing new crop varieties and refining seasonal cultivation systems suited to cold-region climates.

Since their mid-17th century migration, the Daur established permanent farming settlements, transforming riverbanks and plains into productive fields. Their

agricultural economy became the foundation of settlement stability and regional food security in the Nen River Basin. (See Table 1 for major Daur crop varieties and cultivation characteristics.)

Table 1 Crop Types of the Daur Ethnic Group

Table 1 Crop Types of the Daur Ethnic Group (Yina Qiao, 2023)	
Crop Category	Subcategory
Grains	Millet, wheat, buckwheat, rice, potato, sorghum, corn, barley, oats
Cash Crops	Soybeans, beets, tobacco, sunflower
Vegetables and Fruits	Tomatoes, peppers, cucumbers, watermelons, melons, radish, leeks, cabbage, onions, carrots
Forage Crops	Alfalfa, clover, ryegrass, timothy grass, wild grasses for fodder

Since the establishment of the Liao Dynasty by the Khitan, the Daur people have traditionally inhabited areas around rivers and lakes, depending on fishing as one of their primary means of livelihood. Historically, fishing not only served as a subsistence activity but also played an important role in social interaction and cultural continuity. Today, the Nen River and its tributaries—including the Ganhe, Nemoer, Nomin, and Wuyuer Rivers—form an interconnected basin abundant in aquatic resources. This region contains more than a dozen species of freshwater fish such as carp, chub, silver carp, grass carp, crucian carp, pike, and sturgeon. Over generations, the Daur have developed a variety of fishing methods, including square net fishing, fixed seated net fishing, and ice-piercing winter fishing, which reflect their adaptability to seasonal and climatic variations.

Table 2 Table 2 Classification of Daur Fish

Table 2 Classification of Daur Fish			
Local Common Name	Daur Name	Family	Genus
Pike	Car Mo	Esocidae	Esox
Fine-scaled fish	Jeborg	Cyprinidae	Cyprinus
Salmon	Tathus	Salmonidae	Salmo
Willow root fish	Rog	Cyprinidae	Gobio
Carp	Mu Ruji	Cyprinidae	Cyprinus
Crucian carp	Coltger	Cyprinidae	Carassius
Yarrow fish	Forehead	Cyprinidae	Zacco
Bream	Haiho	Cyprinidae	Abramis
Yellowcheek	Hegunne	Cyprinidae	Opsariichthys
Fathead	Taku	Cyprinidae	Aristichthys
Blackfish	Quarre	Channidae	Channa
Catfish	Kutmahler	Siluridae	Silurus
Mandarin fish	Abugu	Sinipercidae	Siniperca
Loach	Mauhanzhimo	Cobitidae	Misgurnus
Sturgeon	Hollebze	Acipenseridae	Acipenser

Furthermore, the wetlands along the eastern foothills of the Greater Khingan Mountains and both banks of the Nen River are home to a vast array of rare wildlife species, boasting remarkable biodiversity. According to statistics, the Molidawa Autonomous Banner alone is home to 93 economically valuable wildlife species, including roe deer, lynxes, black bears, foxes, otters, voles, wild boars, deer, sika deer, and minks. Avian species such as swans, geese, and pheasants also thrive in these habitats. This abundant animal resource not only provides plentiful meat but also supplies raw materials for clothing—such as roe deer hides, lynx pelts, sika deer hides, and mink furs—as well as temporary tent coverings. Hunting remained a vital livelihood for the Daur people until after the establishment of the People's Republic of China, when the government confiscated firearms and banned illegal hunting activities.

2.1.2.3 Social dimensions

1. Social Structure and Clan System: The Daur people, who have long inhabited the northeastern frontier regions, developed under conditions of relative geographical isolation. Due to low productivity and primitive production techniques, their social evolution proceeded gradually, resulting in the long-term preservation of a kinship-based clan system. This three-tiered hierarchical structure—comprising Hala(clan), Mokun (sub-clan), and Begong (family unit)—played an essential role in managing communal resources, organizing production activities, establishing social norms, and maintaining genealogical continuity. This implicit social order profoundly

influenced and structured the spatial organization of traditional Daur settlements. (See Figure 5: Hierarchical Structure of the Daur Social System)

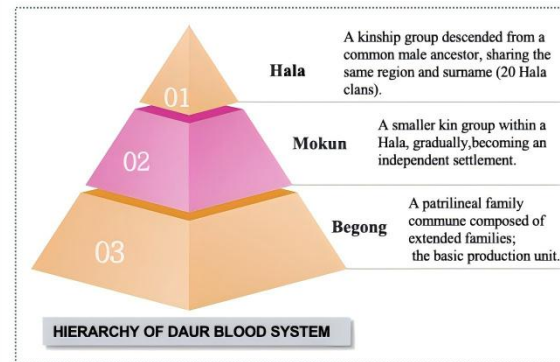


Figure 5 Three-level clan system of the Daur people

2. Language and Cultural Heritage: The Daur language belongs to the Mongolic branch, with four dialect areas in its distribution region—Butaha, Qiqihar, Hailar, and Xinjiang—though there is no unified ethnic script. Historically, Manchu and Mongolian were primarily used, while modern usage predominantly employs Chinese characters, with some individuals also proficient in Mongolian and Kazakh (Wikipedia contributors, n.d.; ChinaCulture.org, 2008). In the 20th century, scholars attempted to create a Daur writing system, including proposals based on Latin letters, Russian alphabet, and phonetic symbols, but none gained widespread adoption. According to the "China Endangered Languages" survey, the Daur language has been classified as a vulnerable language in Heilongjiang Province, with its cultural transmission facing severe threats (Endangered Languages Project, n.d.).

The Daur people have traditionally preserved cultural wisdom through oral traditions such as epics, folk songs, and storytelling. Due to the absence of a writing system, their cultural heritage has long depended on folk artists and oral transmission practices (Into Travel China, n.d.). However, in contemporary society, the impact of modernization and language shifts has created a critical gap in traditional linguistic inheritance. This disruption poses significant challenges to the continuity of ethnic cultures, making it imperative to establish new mechanisms for cultural preservation (Into Travel China, n.d.).

Religion and Beliefs: The Daur people primarily practice Shamanism, with a smaller portion adhering to Lamaism. Deeply rooted in animistic cosmology, Shamanism encompasses nature worship, totem veneration, and ancestral devotion, reflecting the Daur worldview centered on animism and the immortality of the soul.

Shamans, known in the Daur language as “Yadegen”, are traditionally divided into two categories: “Hozhol Yadegen”, who preside over ancestral spirits and domestic rituals, and “Bodhi Yadegen”, who communicate with external or foreign deities. According to Lu and He (n.d., p. 322), Hozhol Yadegen primarily worship indigenous spirits, while Bodhi Yadegen focuses on deities introduced from external cultural influences. (See Figure 6: The Daur people call the shaman "Yadegen")



Figure 6 The Daur people call the shaman "Yadegen"

Sama practitioners typically become shamans after enduring physical suffering, rather than being hereditary. Throughout their lives, they conduct multiple "Ominan" rituals using sacred implements like ceremonial robes, ceremonial drums, prayer beads, and ceremonial ropes. The Daur people regard shamans as intermediaries between humans and spirits, believed to ward off evil, avert disasters, and invoke blessings. Shamanic practices encompass prayer, spirit dances, and memorial ceremonies, with spirit dances for healing being the most prominent form of practice.

With the impact of multiculturalism, the Daur people no longer hold any shamanic activities, and can only see some religious tools in museums at present (as shown in Figure 7 Shamanic religious tools of the Daur National Museum).



Figure 7 Shamanic religious utensils

Shamanic rituals primarily consist of prayer, spirit possession

ceremonies, and memorial observances. Among these, the practice of healing through shamanic spirit possession stands as its most prominent activity. Examples include rituals honoring "Tengger" and "Aobao·Wochibei". Today, the traditional "Aobao" has evolved into an officially organized cultural event that integrates arts, sports, and commerce (as shown in Figure 8: Aobao Sacrificial Area within Hala New Village).



Figure 8 A Mongolian yurt in a Daur village has become a tourist check-in place

4. Festivals and Folk Customs: The Daur people have a rich literature and art, which is an important part of the colorful culture. The Daur literature has a long history, divided into folk oral literature and written literature.

(1) Oral folk literature originated from hunting and fishing traditions, encompassing myths, legends, folk songs, stories, proverbs, and riddles, with folk tales holding the central position. Since the mid-19th century, with the spread of Manchu script, the Daur people developed narrative poems recorded in Manchu called "Wuchun" (or "Wuchen") (Mantu 'ertu, 2007). "Wuchun" is a Daur oral performance art combining melodies and lyrics (as shown in Figure 9: Elder performing Wuchun); "Wurigele" includes fables, legends, and myths; while "Zaendale" refers to folk songs similar to mountain ballads, often sung during herding or labor. The Daur people possess unique ethnic instruments like the "Mukulian" (mouth harp), preserve distinctive folk dances (such as "Hakemai" or "Lurigele") (Figure 10: Lurigele), and excel in crafting birch bark and willow-woven handicrafts, along with tobacco smoking and roe deer leather boot-making techniques. Women's wisdom is embodied in folk arts, embroidery, paper-cutting (as shown in Figure 11: Hani Card paper-cutting), and toy-making. Daur sports are diverse, including wrestling, horse racing, archery, field hockey (called "Beikuo" in Daur), neck strength competitions, pole balancing, and skiing. Field hockey, a traditional sport, saw the establishment of the Mulidawa Daur

Autonomous Banner's field hockey team in 1976, later designated as the "Home of Field Hockey" by the National Sports Commission (as displayed in Figure12: Field hockey event at the Daur Ethnic Museum).



Figure 9 Uchun, a Daur storytelling song
(Source: Xiaohongshu,2024)



Figure 10 Daur Lurigle Dance
(Source: Xiaohongshu,2024)



Figure 11 Daur paper-cutting —— Hani Ka



Figure 12 Hockey display at the Daur Museum

The Daur people's literary and artistic heritage is remarkably vibrant, brimming with distinctive ethnic characteristics. Their cultural legacy spans a broad spectrum, showcasing profound historical depth and diverse forms of expression. While modernization and multicultural influences pose challenges to cultural preservation, the Daur culture remains remarkably significant. Their artistic and sports activities continue to play vital roles in both safeguarding and advancing their cultural identity.

(2) Daur Ethnic Etiquette: As recounted by Elder Teacher An, the Daur people are a nation that values etiquette deeply, a tradition reflecting their tenacious spirit of advancement. In terms of ethics and morality, the Daur community upholds respect for elders, mutual assistance, and hospitality as core virtues. Respecting seniors is paramount – whether on the street or entering a home, younger generations must yield to elders and follow behind them. If juniors fail to meet elders for three days, they must perform the knee-bending salute. The Daur people are exceptionally hospitable, entertaining guests with tobacco, alcohol, and dairy products, particularly valuing ceremonial tobacco gifts. Sincerity, warmth, and hospitality form the moral foundation of Daur etiquette (See Figure 13: Wedding Rituals for Elders and Figure 14: Spring Festival Rituals for Elders).



Figure 13 Newlyweds bow to their parents
(Source: Xiaohongshu,2024)



Figure 14 Paying tribute to parents during Spring Festival
(Source: Xiaohongshu,2024)

(3) Daur Surnames and Clan Organization: Within the Daur ethnic group, “Hala” and “Mokun” denote kinship-based social organizations, both originating from Manchu-Tungusic linguistic roots. A Hala refers to a patrilineal descent group formed by individuals sharing a common male ancestor, functioning as the fundamental kinship unit of Daur society. Each surname corresponds to a specific Hala, and there are approximately twenty distinct surnames, representing twenty corresponding Hala lineages (see Table 3).

The Mokun, a subunit derived from the Hala, exhibits closer familial bonds and operates with the characteristics of a clan-like community (Wu, 2020). Each Mokun bears its own name and maintains a collective genealogy. Periodically, adult male members convene to update the genealogical records. During these assemblies, a respected elder is elected as the Mokunda (clan patriarch), responsible for managing internal affairs. The Mokun meeting, composed of all adult male members, serves as the clan’s highest decision-making authority, addressing matters such as the election or removal of the Mokunda, coordination of collective production and livelihood activities, and the imposition of disciplinary measures on members who violate customary laws. (See Table 3: Surnames and Hala-Mokun Structure of the Daur People).

Table 3 Table 3 Daur Surnames

Table Name of Daur hara	
times	Daur Geohara surname
Before the qing dynasty	German, Fala, Onen, Guo Boer, Sudur, Wu Ran, He Yin, Wu Li, Ndi, Aldan, Horras, Erte, Jinchiri, Buktu, Bi Liyang, Wo, Ge, Sodor, Morden, Tao wood, Eer.Fang, Meng, Wo, Mo, E, Guo, Jin, Wu, Su, He, Tao, Qiao, Xu, Bu, Liu, Suo, Na,
modern times	An, Du, Yang, Shan, Wang, Ji, Kang, Shan, Liang, Ning, Zhao, De, Hu, Chen, Bai, Yu and Tian

(4) The Cradle of the Daur People. As the traditional infant bed for early Daur infants, these cradles demonstrate distinctive craftsmanship and design that set them apart from other ethnic groups in Heilongjiang Province. Featuring smooth surfaces and elegant aesthetics, each cradle can serve for decades or even centuries. This enduring cultural artifact not only reflects the Daur people's long history but also preserves their collective memory through generations.

This cradle resembles a small boat, suspended at an angle from the roof beam. Typically crafted from elm, willow, or plum wood, it measures approximately 0.9 meters long, 0.33 meters wide, and 0.15 meters high, with a gently curved top. The interior is lined with leather, while the exterior features floral fabric. When in use, the infant is placed inside and secured with leather straps or cloth ties. Animal bones (such as fish bones) dangle from the bottom, with a long leather strap nailed to it. Women working on the kang can wrap the rope around their toes, causing the cradle to sway gently when moved, producing rhythmic clinking sounds that resemble a mother's lullaby, soothing the baby to sleep. Suspended diagonally, the cradle allows the infant to stand upright, offering a view of the mother and surroundings, which helps prevent crying (as shown in Figure 15 of the Daur Museum's Daur Cradle exhibit).



Figure 15 The cradle of the Daur people

As a spiritual artifact, the traditional Daur cradles embody profound socio-cultural significance through their craftsmanship, structural design, and artistic forms. These creations carry rich ethnic memories, reflecting the wisdom, folk beliefs, and aesthetic sensibilities of the Daur people. However, with the impact of modern culture, these cultural treasures have gradually faded from daily life, now primarily displayed in museums. The ethnic wisdom they represent is also progressively disappearing from living traditions.

(5) The Daur people's devotion to "Kumule" (a wild herb) stands out in their unique culinary traditions. Particularly cherished is a plant called "Kumule", an annual herb resembling willow wormwood. Growing over half a meter tall with slender leaves, it thrives in riverside willow thickets. Though slightly bitter, its aromatic flavor makes it a favorite among the Daur people. Fresh Kumule is often sun-dried and stored for winter consumption (as shown in Figure 16: Kumule specimen description).



Figure 16 Wild vegetables of Kumule

With the improvement of living standards, all kinds of common ingredients are everywhere, but the traditional wild vegetable "willow artemisia" of the Daur ethnic group has become a rare food on the table. Due to the change of ecological environment, the harvest has gradually decreased, and the once ubiquitous special food has now become a relatively precious ingredient.

(6) Daur Ethnic Attire The Daur people originally wore fur garments, but after the Qing Dynasty transitioned to predominantly cloth attire. Their clothing predominantly features blue, black, and gray hues. Daur women excel in hand embroidery, with their garments, footwear, and pouches adorned with intricate patterns. Hairstyling and accessories vary by region, including head wraps made from white cloth or towels, complemented by various earrings.

In winter, men wear cotton jackets and trousers, while a minority opt for leather pants without hems, along with fur coats or robes. During summer, they adopt the "Gagri" (single-layer robe), while spring and autumn feature the "Jiaqiwarikele" and "Kurumu" (layered robes). Winter attire includes the "Shadegan" (men's cotton-padded jacket) (as shown in Figure 17 of the Daur ethnic costumes).



Figure 17 Daur Ethnic Costume

Today, due to the exquisite craftsmanship and labor-intensive embroidery required for traditional Daur clothing, coupled with their high cost and the rarity of owning such attire among the ethnic group, these garments have gradually faded from daily life. Only during major festivals do a small number of elderly individuals with strong cultural ties wear their ancestral attire, resulting in a diminished ethnic cultural atmosphere.

In summary, the Daur culture is remarkably diverse, encompassing religious beliefs, linguistic traditions, literary arts, ceremonial customs, traditional cuisine, and attire. However, with modernization and cultural influences from outside, many traditional elements are gradually fading away, leaving ethnic cultural traditions increasingly marginalized. Particularly, religious practices and traditional costumes have seen dramatic decline, now only visible during major festivals or in museum settings. To preserve this invaluable cultural heritage of the Daur people, it is crucial to strengthen cultural preservation measures and promote its revitalization and sustainable development.

2.1.3 The Current Development Status of the Daur People in Northeast China

Today, the diverse development trends including globalization, urbanization, marketization, and tourism development – which combine constructive forces like market transformation, capital appreciation, and cultural homogenization with destructive impacts – are impacting the Daur ethnic group. This population-dense

community in remote border regions, characterized by economic underdevelopment and endangered ethnic culture, is witnessing the gradual disappearance of its traditional settlement landscapes and the imminent extinction of indigenous cultural heritage (wu, 2020). Currently, the development of Daur settlements and culture exhibits a coexistence of traditional continuity and modern transformation. On one hand, with increased national-level attention to ethnic cultural preservation and rural revitalization, some traditional cultural elements have been restored and repurposed, drawing growing academic and policy recognition for the Daur people's historical value. However, on the other hand, intensified modernization, urbanization, and population mobility are severely challenging the spatial configurations and cultural practices of traditional settlements (See Figure 18).



Figure 18 Comparison of images of Daur primitive villages and modern villages

In terms of settlement patterns, traditional Daur dwellings and their architectural configurations have largely vanished, with only scattered remnants preserved in isolated villages or museums. Modern rural residences predominantly feature reinforced concrete structures. While these improvements have enhanced living conditions, the absence of regional characteristics and the wisdom of cold-region ecology has led to a gradual erosion of spatial forms and cultural symbolism (Figure 19).



Figure 19 Comparison of Daur primitive dwellings and modern dwellings

1. Cultural heritage

Due to the absence of a standardized writing system and the limited institutional support for modern education, the Daur language has been included in the Catalogue of Endangered Languages in China, officially classified as “vulnerable.” This linguistic fragility mirrors broader challenges faced by Daur intangible heritage, many aspects of which are on the verge of extinction.

Through centuries of sedentary life, the Daur people have cultivated a distinct cultural identity integrating spiritual, artistic, and social traditions. Rooted in Shamanism, their belief system—shared among Tungusic peoples—has fostered a rich ritual culture encompassing music, dance, sports, oral literature, handicrafts, and ceremonial practices. Today, the Daur possess twenty-one items of intangible cultural heritage, including four nationally recognized and seventeen provincially listed elements (See Table 4: Intangible Cultural Heritage Items of the Daur People).

However, as traditional settlements undergo spatial fragmentation and cultural dilution, these invaluable traditions face the risk of distortion or disappearance. The younger generation’s declining proficiency in the Daur language, coupled with the fading of shamanic rituals and the scarcity of artisans mastering crafts such as the Uqin (a traditional bowed string instrument), underscores the urgency of preservation.

Ethnic culture, embodying the interconnection of material forms, spiritual beliefs, spatial environments, and historical continuity, constitutes the living foundation of cultural identity. Preserving intangible heritage therefore entails not only the technical transmission of skills and rituals, but also the safeguarding of their spatial and environmental contexts. Transforming intangible heritage into living, spatially grounded cultural environments (Li, 2018) is thus central to sustaining the Daur people’s cultural vitality and continuity.

Table 4 Translated Table of Daur Intangible Cultural Heritage

Category	National Level	Provincial Level
Dance	131III-28 Daur Dance: Yimige (Yimige)	44NMIII-11 Daur Yimige Dance, Morin Dawa Daur Autonomous Banner
Quyi (Folk Art)	277 V-41 Wuqin (Wuqin)	54NMV-4 Wuqin Song (Wuqin), Morin Dawa Daur Autonomous Banner
Miscellaneous Sports & Traditional Ball Games	297VI-15 Traditional Ball Game	62NMVII-7 Daur Wrestling, Morin Dawa Daur Autonomous Banner; 63NMVII-8 Daur

Category	National Level	Provincial Level
		Traditional Ball Game, Morin Dawa Daur Autonomous Banner; 64NMVII-9 Daur Traditional Archery, Morin Dawa Daur Autonomous Banner; 71NMVII-16 Daur Xiqi, Morin Dawa Daur Autonomous Banner
Music	607-II-108 Folk Song (Kule Opera)	19NMII-8 Daur Folk Song, Morin Dawa Daur Autonomous Banner; 20NMII-9 Kule Opera, Morin Dawa Daur Autonomous Banner
Fine Arts		74NMIII-3 Daur National Painting, Morin Dawa Daur Autonomous Banner
Traditional Crafts & Arts		86NMVII-8 Daur Handicraft, Morin Dawa Daur Autonomous Banner; 82NMVII-14 Daur Birch Bark Utensils, Morin Dawa Daur Autonomous Banner; 87NMVII-9 Daur Traditional Paper Cutting, Morin Dawa Daur Autonomous Banner; 108NMVII-12 Daur Embroidery, Morin Dawa Daur Autonomous Banner

Category	National Level	Provincial Level
Folk Customs		137NMX-43 Daur Wedding Customs, Morin Dawa Daur Autonomous Banner; 6NMX-52 Daur Spring Festival Customs, Morin Dawa Daur Autonomous Banner

2. On the social and economic level

Due to geographical location and natural environment constraints, the overall economic development level of Daur ethnic group settlements is low, infrastructure construction lags behind, employment opportunities are limited, and population outflow is prominent.

With the migration of young rural labor to cities, many villages are experiencing hollowing out and aging. To explore new development paths, some Daur villages have begun transforming by leveraging ethnic cultural resources and rural tourism. For instance, Hala New Village, with local government support, has established a folk culture exhibition area, specialty agritourism facilities, and leisure squares, aiming to revitalize both economy and culture through tourism development. However, in practice, this model remains in its early stages and faces multiple challenges: First, there's an imbalance between cultural preservation and commercialization. Some tourism projects prioritize economic gains, turning folk elements into performances and commercial products that erode authenticity. Second, there's a lack of systematic inheritance mechanisms for traditional skills, languages, and rituals, as they rely on a few inheritors. Third, economic benefits are unevenly distributed, with tourism revenues failing to effectively benefit villagers, making it difficult to achieve sustainable development (As seen in Hala New Village).



Figure 20 Current situation of tourism expansion and renovation in Hala New Village

The current situation of the Daur ethnic group is characterized by "urgent conservation needs, inadequate inheritance mechanisms, and ongoing exploration of development paths". How to achieve a balance between cultural revitalization, spatial optimization, and economic revitalization in the context of modernization and globalization has become the core challenge for the sustainable development of the Daur people.

2.1.4 Policy research

Within the global framework of cultural heritage conservation and sustainable development, policy guidance has increasingly become a key driver for preserving and developing traditional ethnic settlements. For the Daur people, national and local-level policy frameworks not only provide institutional safeguards but also play a vital role in cultural preservation, settlement conservation, and rural revitalization efforts.

First, from the perspective of national policy, the "China Traditional Village List" system implemented since 2012 has provided institutionalized protection pathways for traditional settlements of ethnic minorities, including the Daur people. As of 2023, 8,155 villages nationwide have been included in the national protection list, with Daur settlements such as E 'ermenqin Village and Hala New Village in Heilongjiang Province being listed under key protection. This policy not only emphasizes the preservation of tangible heritage but also highlights the inheritance of intangible cultural heritage, requiring governments at all levels to formulate practical protection plans. Meanwhile, the "Intangible Cultural Heritage Law of the People's Republic of China" (2011) and related supporting regulations provide legal basis for

the preservation and dissemination of ethnic cultures (Figure21).



Figure 21 The sixth batch of China's traditional village list urgently needs protection and inheritance

(Source: Qiao, 2024)

Secondly, from the perspective of regional policy implementation, provinces like Heilongjiang and Inner Mongolia Autonomous Region have introduced cultural preservation and rural revitalization policies tailored to their ethnic characteristics. For instance, the "Heilongjiang Ethnic Rural Revitalization Implementation Plan (2021-2025)" emphasizes boosting rural economic development through cultural resource utilization. It proposes integrating traditional settlement preservation with rural tourism while applying intangible cultural heritage in education, tourism, and social governance. As China's only autonomous Daur region, the Meris Daur Autonomous District has developed a distinctive model combining cultural inheritance, tourism development, and infrastructure construction through policy support.

Thirdly, within the framework of international policy, both UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage (2003) and the Sustainable Development Goals (SDGs, 2015) underscore the vital importance of cultural diversity and sustainability. These frameworks provide a global perspective for preserving Daur ethnic settlements while introducing cross-border experiences to their policy research and implementation practices.

However, practical implementation reveals inherent limitations in the current policy framework. On one hand, conservation measures predominantly remain nominal catalog-based protections lacking concrete enforcement and oversight mechanisms. On the other hand, some cultural settlements exhibit an imbalance between preservation and commercialization, with tourism development showing excessive commercialization tendencies that undermine cultural authenticity and continuity. Therefore, future policy research should integrate institutional design at the macro level with local practices, strengthen dynamic monitoring and feedback mechanisms, and

achieve equilibrium among three key elements: "cultural authenticity, economic development, and community participation."

In conclusion, policy serves not only as a crucial safeguard for preserving the Daur ethnic group's settlement culture but also acts as a strategic instrument to drive its sustainable development. Future research and practice should further explore effective integration between national strategies, local practices, and international experiences, thereby providing stronger policy support for the long-term development of traditional Daur settlements.

2.2 Theoretical research

2.2.1 Sustainable development theory

2.2.1.1 Theoretical origins

The concept of sustainable development is not achieved overnight but gradually formed in the context of global environmental crisis, social development reflection and international policy game. Its development can be divided into the following stages:

1. Germination stage (1960s-1970s)

In the 1960s, as industrialization accelerated, environmental pollution, excessive resource consumption, and ecological degradation became pressing concerns. In 1962, American scholar Rachel Carson exposed the dangers of pesticide pollution in her book *Silent Spring*, sparking a global environmental movement. The Club of Rome's 1972 publication *The Limits to Growth* used systems dynamics models to first highlight the conflict between humanity's limitless growth and finite resources, warning of critical risks to environmental, economic, and social development. This period saw the emergence of sustainable development principles, with the core challenge being how to prevent irreversible damage to nature from "development".

2. Institutionalization phase (1980s)

In 1987, the World Commission on Environment and Development (WCED) released "Our Common Future", which first introduced the classic definition of "sustainable development": meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). This statement unified ecological conservation with economic development, becoming a consensus among global academia and policymakers. Meanwhile, the United Nations Environment Programme (UNEP) and UNESCO spearheaded multiple international

research initiatives, transforming sustainable development from an ideal into actionable goals for global cooperation.

3. Globalization and multidimensional expansion (1990s-early 21st century)

In 1992, the United Nations convened the Earth Summit in Rio de Janeiro, adopting the Rio Declaration on Environment and Development and Agenda 21. These documents explicitly stated that sustainable development should encompass three pillars: environmental, economic, and social dimensions. Subsequently, the "Triple Bottom Line" theory (Elkington, 1997) proposed that development performance should not be measured solely through economic metrics but must also consider ecological and social aspects. Concurrently, scholars began advocating for integrating culture into the core of sustainable development, recognizing it as the foundation of social values, identity, and creativity (Throsby, 1999,2001; Hawkes, 2001).

4. Contemporary deepening stage (2015-present)

In 2015, the United Nations formally adopted the 2030 Agenda for Sustainable Development, proposing 17 Sustainable Development Goals (SDGs). These goals address multiple dimensions including poverty eradication, quality education, sustainable cities and communities, climate action, and the preservation of cultural and natural heritage (United Nations, 2015). This agenda marks a new phase of systematic and multi-objective governance in sustainable development. Particularly in the field of cultural heritage conservation, UNESCO emphasizes that culture is not merely an "appendage" to development but serves as one of the core drivers of sustainable progress (UNESCO, 2003,2011).

5. Academic and practical trends

In recent years, sustainable development theory has increasingly integrated with multiple disciplines such as environmental science, economics, anthropology, urban-rural planning, and cultural heritage studies within academic circles. Scholars have proposed new concepts like "resilient development" (Folke, 2006) and "ecological civilization" (Liu et al., 2015) to address the limitations of traditional sustainability theories. At the practical level, an increasing number of countries are incorporating the preservation of traditional settlements and intangible cultural heritage into their sustainable development strategies, exploring ways to achieve community economic revitalization and social sustainability through cultural and tourism industries while maintaining authenticity.

2.2.1.2 Academic value

At the academic level, the theory of sustainable development demonstrates profound interdisciplinary significance and theoretical breakthroughs. Firstly, it challenges the conventional growth-oriented development paradigm by transforming development from a linear, single-dimensional economic expansion model into a multidimensional, systematic holistic approach. The classic "Triple Bottom Line" framework (Triple Bottom Line, Elkington, 1997) juxtaposes environmental, economic, and social dimensions, emphasizing their equal weight in decision-making and evaluation processes. This theoretical evolution not only drives the renewal of research paradigms in global academia but also provides new reference logic for policy design in developing countries and ethnic minority regions.

Building upon the Three Lines of Culture framework, scholars have progressively proposed "culture as the fourth pillar" (Hawkes, 2001; Throsby, 2001), asserting that culture serves as the core element sustaining social identity, values, and creativity. The continuity and innovation of cultural heritage should be regarded as crucial indicators of sustainable development. Within this paradigm, cultural assets, local wisdom, and ethnic memory are not mere appendages but serve as key drivers for sustainable progress. This cultural dimension provides a robust theoretical foundation for studies on traditional settlements and ethnic minority communities.

Third, at the methodological level, the theory of sustainable development has driven interdisciplinary integration. It combines research methodologies from multiple disciplines including environmental science (resource carrying capacity, ecological footprint), economics (cost-benefit analysis, cultural capital), sociology (equity, participation, governance), and anthropology (identity, traditional knowledge), forming a multifaceted and interconnected research paradigm. This interdisciplinary integration provides new tools for analyzing complex systems such as ethnic settlement spaces, enabling more accurate revelation of interactions between environmental constraints, social institutions, economic activities, and cultural traditions.

Fourth, the theory demonstrates exceptional applicability in cultural heritage and settlement preservation. It not only addresses physical aspects like building energy efficiency and ecological adaptability but also emphasizes the equal importance of social value, cultural significance, and community cohesion. For instance, in ethnic minority settlements of cold regions, the sustainable development theory provides researchers with a systematic analytical framework spanning macro, meso, and micro

levels: The macro level focuses on harmonizing settlements with natural environments; the meso level examines interactions between economic development and social structures; while the micro level zeroes in on cultural practices and lifestyles of ethnic groups. This multidimensional analytical approach offers theoretical support for revealing the complexity and diversity inherent in traditional settlements.

In the global academic context, sustainable development theory demonstrates strong alignment with international policy frameworks. For instance, UNESCO (2003,2011) emphasizes the preservation of intangible cultural heritage and historical landscapes, which resonates with the principle of "cultural continuity and identity" advocated by sustainable development theory. Applying this theory to research on ethnic minority settlements like the Daur people not only aids in exploring cultural preservation strategies for these communities, but also provides case studies and practical references for the global sustainable development agenda.

In conclusion, the academic value of sustainable development theory lies in: achieving a paradigm shift from economic-centric approaches to multidimensional holistic development; promoting the widespread acceptance of culture as a core element of sustainable development among academia and policymakers; providing interdisciplinary research frameworks and methodologies; and offering systematic theoretical support for the preservation and revitalization of traditional settlements and ethnic cultural heritage.

2.2.1.3 International policy framework

The Convention for the Safeguarding of Intangible Cultural Heritage, adopted by UNESCO in 2003, emphasizes that cultural heritage constitutes a vital component of sustainable development, particularly regarding traditional ethnic knowledge, local wisdom, and cultural diversity (UNESCO, 2003). Meanwhile, the Recommendation on the Protection of the Historic Urban Landscape (UNESCO, 2011) advocates for "holistic preservation," requiring urban and rural spatial renewal to integrate cultural heritage protection with modern lifestyles. These international policies provide crucial references for preserving ethnic minority settlements, including those of the Daur people, demonstrating that traditional settlements are not only remnants of human habitation but also vital resources for global sustainable development strategies.

2.2.1.4 Synergy with the study of Daur settlements

As one of the smaller ethnic groups in China, the Daur people's settlement culture demonstrates typical cold-region ecological adaptation and ethnic wisdom. For a long time, under natural environmental constraints, their settlements have formed spatial patterns that rely on water systems and adapt to climate conditions, along with a livelihood approach combining agriculture, animal husbandry, fishing, and hunting. This inherently embodies the "ecological wisdom" of sustainable development. However, with the acceleration of modernization and urbanization, traditional settlement spaces have shown heterogeneity and decline, while the younger generation's cultural identity with their own ethnicity has gradually weakened.

In this context, applying the theory of sustainable development to the analysis of Daur ethnic settlements not only reveals their adaptability and inadequacies in economic and cultural dimensions, but also provides theoretical guidance for constructing a sustainable development model aligned with the goals of "cultural continuity and community participation." For instance, in line with the sustainable development goals illustrated in the figure, from an economic perspective, we can focus on how Ermenqin Village leverages its cultural capital to develop characteristic cultural tourism and ethnic industries, contributing to economic growth and decent employment (Goal 8); from a socio-cultural perspective, emphasis should be placed on the living inheritance of rituals, language, and folk customs to enhance community cohesion, while promoting the integration of traditional production and lifestyle with modern development needs, thereby supporting responsible consumption and production (Goal 12).

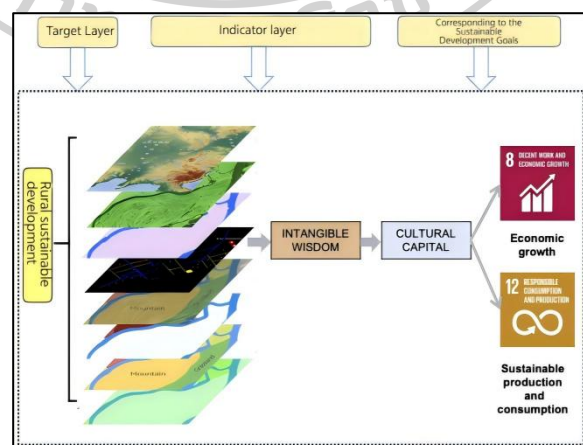


Figure 22 Sustainable development of settlement space of Daur people

2.2.1.5 Methodology and outputs

In this study, the theory of sustainable development will be implemented through the following methods: index system construction: based on the four dimensions of environment, economy, society and culture, an "cultural sustainability evaluation framework" suitable for ethnic minority settlements in cold areas will be established.

1. Data collection: Field research, interviews and questionnaires were used to collect practical data on environmental adaptation, economic structure and cultural inheritance.

2. Multidimensional analysis: SWOT analysis and other methods are used to comprehensively evaluate the advantages, disadvantages, opportunities and threats of the settlement.

3. Output and Contribution: Propose a sustainable development path suitable for the Daur settlements and form a theoretical model that takes into account cultural protection, economic revitalization and cultural inheritance.

Through this research process, the study not only theoretically expands the application of sustainable development in ethnic minority settlements in cold regions, but also provides an operational framework for the conservation and development of Ermenqin Village in practice. This initiative not only aligns with China's rural revitalization strategy, but also responds to the core requirements of the global sustainable development agenda.

2.2.2 Narrative theory

2.2.2.1 Theoretical origins

Narratology originated from literary criticism and structuralist linguistics. In the mid-20th century, as structuralism gained momentum in Europe, scholars began employing formalized methods to study narrative phenomena. French scholar Roland Barthes first proposed in his 1966 work *The Structure of Narrative Works* that narratives possess universality, suggesting that myths, novels, history, and even everyday conversations could be interpreted through narrative frameworks. Later, Gerard Genette systematically developed the analytical framework of "time, voice, and perspective" in his 1980 treatise *Discourse in Narrative*, establishing the foundational system of narratology.

Since the 1980s, Paul Ricoeur proposed in his seminal work *Time and Narrative* that narrative is not merely a linguistic structure, but fundamentally serves as

humanity's mode of experiencing and interpreting history. Through storytelling, humans can organize scattered events into logically coherent and meaningful wholes, thereby establishing continuity in identity across time for both individuals and communities. This has established narrative as the central theoretical framework for studying social memory, identity formation, and historical understanding.

In the 21st century, narratology has expanded beyond literary studies to encompass history, anthropology, sociology, cultural heritage studies, and digital humanities. Marie-Laure Ryan (2004) introduced the concept of "transmedia narratives," demonstrating that storytelling extends far beyond text to include images, film, interactive media, and virtual spaces. David Herman (2009) emphasized that "narrative is a cognitive framework," asserting it serves as humanity's primary means of organizing experiences and interpreting the world. Consequently, narratology has evolved into an interdisciplinary theory examining how culture and society construct meaning and identity through storytelling.

2.2.2.2 Academic value

The academic value of narratology is reflected in the following aspects:

1. Narratology provides a structured tool for the study of cultural experience.

By distinguishing between "story (story) -discourse (discourse) - audience (audience)", narratology reveals the narrative logic behind cultural phenomena. For instance, a traditional festival is not merely an event itself but also encompasses temporal sequencing (festival calendar), narrative voice (who narrates), and perspective (how groups internally interpret and how externally represent). This analytical framework helps researchers deeply understand how cultural practices gain meaning through narrative.

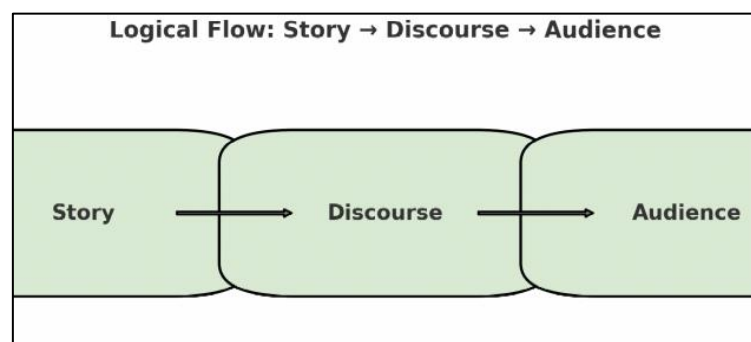


Figure 23 Narrative logic diagram

2. Narratology expands the study of identity and memory.

In his 1984 work, Ricoeur introduced the concept of "narrative identity," proposing that humans construct complete historical narratives from fragmented memories. Through storytelling, individuals and communities build and sustain their collective identities. In studies of ethnic minority settlements, this perspective reveals that such communities are not merely physical spaces, but also enduring repositories of ethnic stories and collective memory.

3. Narratology provides methodological support for cross-media cultural communication.

With the advancement of digital technology, traditional oral narratives are being reinterpreted through diverse formats including text, visual media, and virtual exhibitions. Narratology's cross-media theory emphasizes that while narratives across different platforms require structural adaptations to their specific mediums, core narrative frameworks such as hero archetypes, ritualized storytelling, and spatial narratives can achieve cross-platform dissemination (Ryan, 2004). This methodology proves particularly crucial for the digital preservation and presentation of intangible cultural heritage.

4. Narratology emphasizes the interactivity and interpretability of narrative.

The audience is no longer passive recipients but a community actively participating in the construction of narrative meaning (Herman, 2009). This holds significant implications for the dissemination of ethnic minority cultures: When tourists, scholars, or younger generations engage in narrating and reimagining these stories, they collectively shape contemporary expressions of their cultural heritage.

2.2.2.3 Synergy with the study of Daur settlements

In the Daur settlement, the narrative logic is reflected in the spatial layout, social practice and cultural activities:

1. Spatial narrative

The street patterns and courtyard layouts of settlements are not only functional choices, but also spatial expressions of clan systems, kinship relations and social order. For example, the clan system of "Hala-Moqun-Begong" is not only reflected in the social structure, but also narrated through the settlement pattern.

2. Cultural narratives

The Daur people's epics, ballads and folk tales form the collective memory of their ethnic group. Through oral transmission, these narratives are constantly reproduced and become an important means to maintain group identity. However, in modern society, the narrative chain has broken, and the younger generation's memory of traditional stories is gradually fading.

3. Ritual Narratives: The Daur people's sacrificial rituals, weddings, hunting festivals, and other ceremonies serve as tangible manifestations of narrative at the ritual level. Each ceremony not only reenacts their ethnic beliefs but also strengthens social cohesion. With modernization, many rituals have been simplified or downplayed, gradually diminishing the space for cultural narratives.

In this context, the introduction of narratology theory into the study of Daur ethnic group can systematically organize and reproduce these narrative logic, which can not only be used for cultural interpretation, but also realize the contemporary expression of narrative through digital media (virtual exhibition hall, digital story, interactive device), so as to rebuild cultural identity.

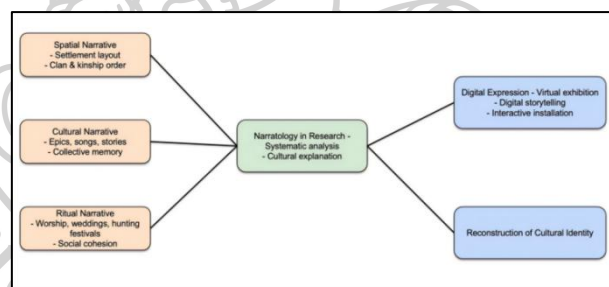


Figure 24 Narrative logic of Daur settlement

2.2.2.4 Methodology and outputs

1. Combined with narratology theory, this study will adopt the following methods:

(1) Oral history and text analysis: Through interviews with elders, cultural inheritors and community residents of the Daur ethnic group, epics, folk stories and ritual songs and dances are recorded, and text and structural analysis are combined with existing documents.

(2) Space-narrative mapping: Construct "narrative mapping" to correspond story events to settlement spatial nodes, revealing how settlements carry cultural narratives through space.

(3) Digital narrative translation: Using virtual exhibition halls, digital images and interactive media, the traditional narrative is translated into cross-media stories for public display and cross-cultural communication.

(4) Audience research and feedback: Through survey and participatory research, collect the understanding and feedback of different audiences (villagers, tourists, scholars) on the narrative, and test the effect of the narrative in cultural communication.

2. Research outputs:

To construct a narrative model of Daur settlements and explain the interaction mechanism between cultural narratives and spatial forms. To develop digital narrative exhibition halls to realize cross-media communication and education of Daur culture.

To form a cultural narrative protection framework of ethnic settlements, and provide theoretical and practical reference for the protection of ethnic minority cultural heritage.

2.2.3 Communication Theory

2.2.3.1 Theoretical origins

The origins of communication theory can be traced to early 20th-century journalism and sociological studies. Lasswell (1948) proposed the seminal communication formula: "Who said what, through which channel, to whom, with what effect," marking the formation of communication studies' early framework. Subsequently, Shannon and Weaver (1949) introduced the linear model of source code, channel, decoding, and receiver" in their seminal work *A Mathematical Theory of Communication*, providing a scientific and engineering foundation for communication research.

In the mid-20th century, communication studies began integrating with sociocultural research. Schramm (1954) emphasized that communication is a two-way interactive process rather than mere one-way transmission. Hall's (1980) "encoding-decoding" theory highlighted how information meanings undergo multiple translations during audience interpretation, making communication a dynamic and open-ended process. Entering the 21st century, with the development of internet and digital technologies, communication theories expanded into research areas of networked societies and media convergence (Jenkins, 2006), proposing new frameworks such as "convergence culture" and "participatory communication".

Therefore, communication theory has gradually developed from unidirectional linear model to two-way interactive model to multi-participation model, and gradually become an important theoretical tool to explain cultural communication and social identity.

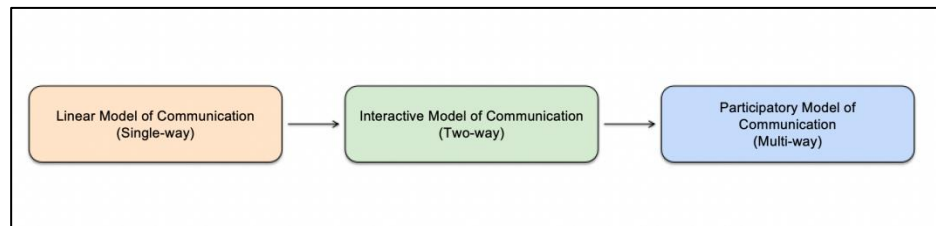


Figure 25 Theoretical development process of communication

2.2.3.2 Academic value

The academic value of communication theory is reflected in the following aspects:

First, it provides a basic model for information circulation and cultural communication.

From Lasswell's "5W" model to Shannon and Weaver's linear model, communication science has laid a scientific understanding of the process of information transmission, enabling researchers to decompose and analyze the transmission mechanism of culture at different stages.

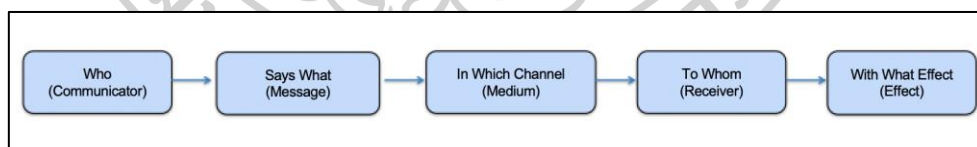


Figure 26 "5W" model

Second, emphasize the initiative of the audience and multiple interpretations.

Hall's "encoding and decoding" model points out that audiences are not passive recipients of information, but interpret it based on their own cultural background. This view is particularly important for the dissemination of national culture, because cultural information is often given different meanings among different groups.

Third, promote the integration of communication research and digital media.

In the new media era, communication theories have expanded to domains such as social media, virtual exhibition halls, and short video platforms, emphasizing the role of audiences as "co-creators". This participatory communication not only transforms cultural dissemination methods but also makes cultural preservation and transmission more open and diverse.

Fourth, provide interdisciplinary research tools.

By integrating the methodologies of psychology, sociology, anthropology and semiotics, communication studies can reveal the complex processes of culture in communication, reproduction and identity construction. This interdisciplinary perspective provides theoretical support for the dissemination and preservation of ethnic minority cultures.

2.2.3.3 Synergy with the study of Daur settlements

The Daur ethnic group's settlement culture relies heavily on oral traditions and folk artists as its primary means of cultural transmission, forming what is essentially a "cultural chain". However, in the modern era, this traditional transmission mechanism has faced disruptions: younger generations are unfamiliar with traditional language and stories, while rituals and folk customs have been simplified or even disappeared.

In this case, the introduction of communication theory is of great significance:

1. Information transmission: The "original code" of Daur culture is reconstructed through oral history recording, audio and video collection and text arrangement.
2. Interactive communication: With the help of museums, exhibition halls and community activities, cultural information is transmitted and decoded among different groups.
3. Digital communication: Traditional culture can be transformed into digital content through virtual exhibition halls, short video platforms and interactive media to realize cross-regional communication.
4. Audience participation: Let the Daur villagers and the younger generation become participants in cultural communication, rather than just being

studied or displayed.

Therefore, communication theory can not only help to reveal the reasons for the rupture of Daur cultural communication, but also provide theoretical guidance for its construction of new communication mode.

2.2.3.4 Methodology and outputs

1. This study will be based on communication theory and adopt the following research methods:

(1) Communication chain analysis: sort out the chain of Daur culture from "encoding, transmission, decoding and feedback", and identify the fracture points and weak links.

(2) Media comparison study: compare the adaptability and limitations of different media such as oral, writing, video and digital exhibition hall to cultural communication.

(3) Participatory communication experiment: through workshops and community activities, the interaction patterns of villagers, students and tourists in the communication process are tested.

(4) Digital platform design: Develop a communication mechanism based on virtual exhibition hall and social media to realize the cross-media continuation and promotion of culture.

2. Research outputs:

We propose a three-dimensional framework for Daur ethnic cultural dissemination (traditional transmission, community-based communication, and digital outreach). This initiative establishes a digital cultural platform featuring virtual exhibition halls, multimedia archives, and interactive systems. The developed model demonstrates the application of communication studies in preserving ethnic minority cultures, offering replicable solutions for digital preservation strategies across diverse cultural contexts.

2.2.4 Cultural Model Theory

2.2.4.1 Theoretical origins

A Cultural Model is a theoretical framework or tool used to describe, understand, and analyze the inherent structure and dynamics of a specific culture. It helps reveal the beliefs, values, behavioral norms, and social practices of a cultural

group, which are typically embedded in the language, art, customs, institutions, and other symbolic systems of that culture.

International Research on Cultural Models: Cultural traits refer to the unique beliefs, values, behavioral norms, and social practices of a cultural group. These elements are typically embedded in the culture's language, art, customs, institutions, and other symbolic systems. Cultural traits reflect a group's belief system and value concepts, guiding members' daily behaviors and decision-making (Hofstede, G., 1980). They encompass symbols and symbolic systems like language and art; behavioral norms and social practices such as etiquette and family structures; as well as cognitive patterns including thinking styles and problem-solving strategies. Cultural traits are also influenced by historical and contextual factors, such as wars, colonization, and trade events. By understanding cultural traits, we can enhance cross-cultural communication and promote cultural preservation and inheritance (Schwartz, S.H., 1992).

The first systematic exposition of cultural models was Holland and Quinn's edited work "Cultural Models in Language and Thought". The authors defined culture as "the shared, presupposed framework of life worlds that people within a society take for granted, serving as a crucial tool for interpreting the world and guiding social actions" (Holland & Quinn, 1987). Widely cited cultural models in academia also include Geert Hofstede's Cultural Dimensions Model and Edward T. Hall's "Cultural Iceberg Model". Hall (1976) used the metaphor of an "iceberg" to reveal three dimensions of culture: the visible (observable behaviors and customs like history and folklore), the middle (values and beliefs), and the deep (core ideologies and spirit). This theory suggests that while the visible part of culture occupies a small proportion, the submerged portion forms the underlying structure that supports surface-level cultural expressions but is often overlooked. Meanwhile, Hofstede (1980) conducted extensive cross-cultural research, identifying key dimensions of cultural differences such as power distance, individualism versus collectivism, and uncertainty avoidance. These findings laid the theoretical foundation for subsequent cultural comparison studies and intercultural communication.

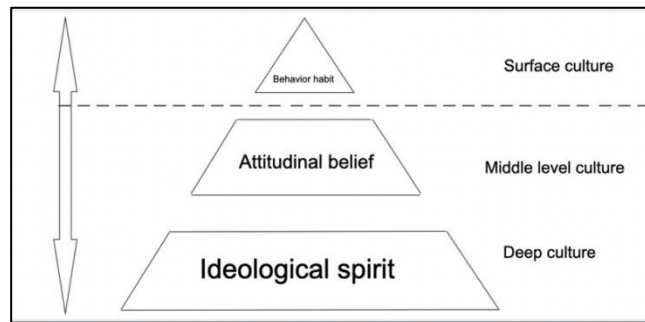


Figure 27 Geert Hofstede cultural dimension model

2.2.4.2 Academic value

First, reveal the internal connection between culture and cognition. Cultural models emphasize that human cognition does not exist in isolation but is deeply embedded within cultural contexts. Groups understand natural environments, social relationships, and historical memories through shared "cultural models." For instance, the Daur people's choice to live near water sources and develop a composite livelihood model of "fishing-hunting-agriculture-pastoralism" fundamentally reflects how cultural models manifest in cognition and practice.

Second, it provides theoretical support for cultural heritage and settlement protection. The cultural model theory explains how certain settlement patterns, architectural forms, and ritual traditions have endured for centuries. These are not merely functional choices but manifestations of cognitive frameworks. By studying cultural models, we can uncover the underlying logic behind settlements, thereby preventing one-sided and superficial approaches in preservation and renewal efforts.

Third, promote the integration of interdisciplinary research. The cultural model theory transcends the boundaries of cognitive linguistics, anthropology, sociology, and history. By integrating semiotic studies of meaning, cognitive frameworks from cognitive science, anthropological fieldwork, and sociological institutional analysis, it serves as a comprehensive tool for examining complex cultural phenomena. This interdisciplinary approach enables a holistic understanding of the social and cultural dimensions within ethnic minority settlements.

Fourth, strengthen the research of cultural identity and group consciousness. Cultural models not only explain how cultures are shared, but also reveal how they sustain group identity. For ethnic minorities, understanding and

reconstructing their cultural models is crucial for cultural inheritance and identity formation. Particularly under the impact of globalization and modernization, research on cultural models can provide both theoretical and practical value for cultural preservation and renewal.

2.2.4.3 Convergence with research on Daur settlements

The formation and development of Daur settlements are highly dependent on their internal cultural models, which are embodied in the following aspects:

Spatial culture model: The Daur settlements are mostly built along the water, and the spatial layout emphasizes the harmony between man and nature. This is not only the result of environmental adaptation, but also the "water vein logic" in the cultural model.

Social and cultural model: The clan system (Hala-Moqun-Begong) defines the way of social organization and resource allocation. This system is both a social structure and a cultural model.

Model of belief and ritual culture: Shamanism, ancestor worship, festival activities and so on constitute the spiritual world of the Daur people. They maintain the cohesion of the group through a shared ritual framework.

Language and Narrative Cultural Models: Epics, Ballads, and Oral Traditions are not only cultural expressions, but also mechanisms for the continuation of cognitive models.

However, during the modernization process, many cultural models are gradually becoming obsolete. The younger generation's grasp of oral traditions has diminished, traditional settlement patterns have been replaced by modern housing, and ceremonial activities have been simplified. This indicates that cultural models are at risk of disintegration. Through the lens of cultural model theory, we can reconstruct the cultural cognitive framework of the Daur ethnic group, thereby providing a theoretical foundation for settlement preservation.

From the perspective of model theory, the cultural cognitive framework of Daur people can be reconstructed and the theoretical basis for settlement protection can be provided.

2.2.4.4 Methodology and outputs

1. Combined with cultural model theory, this study adopts the following

methods:

(1) Cultural symbol analysis: Through field investigation and literature review, identify the repeated symbols in the settlement (such as building orientation, public meadow, ritual place), and analyze the connotation of its cultural model.

(2) Cognitive framework modeling: transform the oral tradition, festival activities, social system and spatial form of the settlement into a visual cultural model framework, revealing the interaction between cognition and practice.

(3) Cross-media expression: Use images, models and virtual exhibition halls to concretize abstract cultural models and enhance public understanding and communication.

(4) Comparative study: compare the cultural model of Daur and other coldland ethnic groups, and analyze their uniqueness and universality.

(5) Community participation research: Through workshops and interviews, members of the Daur community are allowed to participate in the collation and reproduction of cultural models, so as to realize the "bottom-up" cultural cognition and protection.

2. Research outputs:

To construct a cultural model framework of the Daur ethnic group, reveal the logic of its settlement space, social system and cultural activities. To form a practical path for the protection and inheritance of cultural models, and transform intangible cognition into tangible space and educational tools.

A framework integrating cultural models with sustainable settlement development is proposed to provide reference for the protection of cultural heritage in China and other ethnic minority areas.

2.3 Structure and Model of Cultural Expression

2.3.1 Expression Structure

The structure of cultural expression is the "skeleton" of cultural existence and continuity. It reveals what core parts a national culture consists of and how these parts interact with each other. In the study of Daur settlement and culture, the expression structure can be divided into four levels:

(1) Tangible layer

The material layer represents the most tangible manifestation of culture. The

Daur ethnic group's dwellings, characterized by thick-walled structures with small windows, thatched roofs, and earthen-wooden frameworks, epitomize their adaptive wisdom for cold climates. Their settlements are strategically located near water sources, forming an ecological pattern of "establishing communities along waterways and following water flows." Additionally, hunting tools (such as harpoons and nets), pastoral implements, farming equipment, traditional clothing, and ornaments all constitute material culture. These elements not only fulfill daily needs but also reflect the ethnic group's aesthetic sensibilities and values. For instance, the embroidered patterns on women's garments often carry symbolic meanings of blessings and nature worship.

(2) Institutional layer

The institutional framework embodies the organizational and operational logic of cultural systems. The Daur people have long maintained a clan system centered on "Hala-Mokun-Begong": Hala refers to major clan units composed of descendants sharing a common ancestor, controlling land and resources; Mokun represents secondary clan branches responsible for rituals, mediation, and production organization; Begong denotes family-centered micro-entities forming the smallest settlement unit. This system governs land distribution, rules for communal meadow usage, marital and kinship obligations, and directly shapes settlement spatial patterns— Cohesive bloodline groups typically reside in contiguous neighborhoods or zones, creating a distinctive "bloodline settlement" spatial configuration.

(3) Behavioral layer

The behavioral dimension represents the most dynamic aspect of cultural vitality, reflecting ethnic communities' practices in daily life and festive celebrations. For the Daur people, representative behaviors include: ceremonial rituals such as the "Blackening Festival", hunting festivals, weddings, and funerals; diversified economic activities combining fishing, farming, and animal husbandry; and recreational sports like wrestling, archery, and horse racing. These activities not only serve as entertainment but also function as vital means of identity expression and physical demonstration. Through continuous renewal and reinvention of cultural practices in daily life, these behaviors strengthen internal cohesion within the community.

(4) Mental layer

The psychological dimension constitutes the deepest cultural driving force, manifested through core values, beliefs, and collective identity. The Daur people's

traditional belief system, rooted in Shamanism, revolves around veneration of natural deities including sky gods (tenger), mountain spirits, and water guardians. This spiritual framework not only guides sacrificial rituals and festive celebrations but also shapes their philosophy of "harmonious coexistence between humanity and nature." Simultaneously, cultural identity tied to ancestral homeland and clan lineage forms the foundation of their collective consciousness. Even amidst modernization's challenges, this psychological layer continues to serve as an invisible yet vital force sustaining ethnic cultural cohesion.

In essence, the cultural expression of the Daur ethnic group forms a four-in-one system encompassing "material, institutional, behavioral, and psychological" dimensions. The material layer provides the physical foundation, the institutional layer ensures organizational order, the behavioral layer facilitates the dynamic transmission of culture, while the psychological layer serves as the spiritual core that sustains cultural integrity and continuity.

2.3.2 Expression Model

The Cultural Expression Model illustrates how traditional Daur culture is identified, transformed, and sustained through social and spatial practices. Grounded in Edward T. Hall's "Iceberg Model of Culture", it emphasizes the transformation of deep cultural meanings into visible spatial forms, creating a continuous cycle of cultural recognition, reinterpretation, and renewal.

2.3.2.1 Cultural Identification

This stage focuses on identifying the cultural genes embedded in beliefs, rituals, and spatial practices. Through field research and oral histories, symbolic elements such as the Majiafang dwelling, west-facing window, freestanding chimney, and the clan-based Hala-Moqun-Begong settlement order are extracted as core markers of cultural identity. These elements serve as bridges connecting intangible beliefs with tangible architectural and spatial structures.

2.3.2.2 Cultural Transformation and Dissemination

Identified cultural meanings are reinterpreted and re-embedded into both physical and digital environments. Transformation occurs through the spatial restructuring of cultural expressions—embedding symbolic meanings into architecture, exhibition spaces, and interactive digital platforms such as virtual museums. Dissemination extends these cultural expressions through education, cultural tourism, and social media, ensuring that Daur culture reaches broader and more diverse audiences beyond its local context.

2.3.2.3 Cultural Sustainability

Cultural sustainability ensures the adaptive evolution and long-term vitality of traditional culture. By integrating heritage transmission with rural revitalization, community-based workshops, and youth participation, Daur culture is embedded into daily life as a living, evolving system.

This model thus establishes a cyclical mechanism in which Daur cultural traditions are not merely preserved but continuously regenerated through spatial and social renewal.

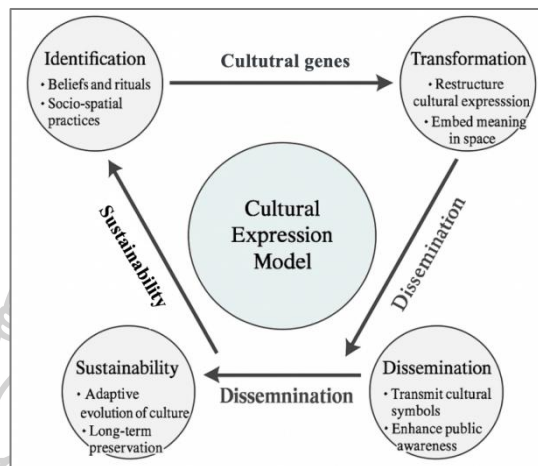


Figure 28 Cultural Expression Mechanism of Daur Settlement

2.4 Case Studies

2.4.1 Preservation of the Shirakawa-go Gassho-zukuri Settlement

Background: Shirakawa-go, located in a snow-covered area of Japan, is famous for its "hakusou" architecture. Its steep slope that has thatched roofs effectively addresses the need for snow accumulation and insulation.

Research method: Relying on the collective cooperation mechanism of villagers, the roof is replaced every few decades, and it is protected internationally in the UNESCO World Heritage List. Protection and utilization go hand in hand, and the village has developed an economic model dominated by cultural tourism.

Research results: While realizing the protection of cultural heritage, the settlement of Hesouzao has developed a stable tourism industry, which has improved residents' income and international influence.

Case study: This case demonstrates the importance of combining community participation with external support. For the Daur settlement, it is important to promote interaction between collective villager autonomy and government/international support in order to ensure a balance between cultural preservation and economic development.



Figure 29 Case1: The Gassho-zukuri settlement in Shirakawa-go
(Source: https://www.vill.shirakawa.lg.jp/1539.htm?utm_source=chatgpt.com)

2.4.2 Protection and Inheritance of Fujian Tulou

Background: Fujian Tulou is a typical defensive group settlement. The thick rammed earth wall not only has the function of defense but also has strong thermal insulation and heat insulation performance.

Research method: The 46 UNESCO listed sites of Fujian Tulou are revitalized by the "protection + tourism" approach, and the inheritance is realized by combining guided tours, museum exhibitions and the continuation of community living.

Research results: Tulou still retains the architectural wisdom of "warm in winter and cool in summer" and has become an important tourism resource in Fujian province, promoting economic development.

Case revelation: This case shows that architectural wisdom and the revitalization of cultural space are indispensable. The thick walls and small Windows of traditional Daur dwellings also have energy-saving potential, which should be optimized through modern technology and economic revitalization through cultural tourism.



Figure 30 Case 2 :of the Preservation of Fujian Tulou Wisdom of Hakka Settlements

(Source: https://whc.unesco.org/en/list/1113/?utm_source=chatgpt.com)

2.4.3 Guizhou Dong Drum Tower and Night Cultural Activation

Background: The Dong ethnic drum tower is the center of community public life and spiritual culture, but the homogenization and excessive commercialization in tourism development lead to the gradual weakening of cultural characteristics.

Research method: Adopt the "culture-tourism-community" three-in-one protection and utilization model, develop nighttime cultural tourism (such as drum tower night tour, wind and rain bridge performance), and put forward anti-homogeneous protection plan.

Research results: Cultural nodes such as Drum Tower and Wind and Rain Bridge have been revitalized, community participation has been significantly improved, and protection strategies to prevent homogeneity have been put forward.

Case revelation: For the Daur people, this case shows that we should avoid the tendency of performance of cultural display, strengthen the dominant position of the community in the process of protection, and promote the living inheritance of intangible culture.



Figure 31 Case 3: Village Drum Tower and Night Culture Revitalization Huanggang

(Source: https://www.eguizhou.gov.cn/2025-03/27/c_1081475.htm?utm_source=chatgpt.com)

2.4.4 Protection of Traditional Villages and Homestay Economy in Zhejiang, China

Background: Some traditional villages in Zhejiang province have a "hollowing out" phenomenon, with serious abandonment of houses and the gradual disappearance of rammed earth and wooden buildings.

Research method: The comprehensive mode of "traditional village protection +

homestay economy + designer stay" is adopted to realize the revitalization of villages by retaining the building structure, developing homestay tourism and introducing artistic creation.

Research results: the village has been regenerated, the villagers' income has increased, and the village has gradually been paid attention by the academic circles and the media, which has enhanced its cultural value.

Case revelation: This case shows that protection and industrial integration are the path of rural revitalization. The Daur settlement can achieve a win-win situation between protection and development through cultural tourism, handicraft experience, ecological agriculture and animal husbandry.



Figure 32 Case 4: The Gassho-zukuri settlement in Shirakawa-go

(Source: http://mbd.baidu.com/newspage/data/dtlandingsuper?nid=dt_4062192069164314166)

2.4.5 China Tang Dynasty Changsha Ancient City Restoration Model

Background: The historical value of the ancient city site of Changsha in the Tang Dynasty is outstanding, but it is difficult for the public to intuitively perceive it through the existing relics.

Research method: The "node-function-cognition" method is adopted to reconstruct the historical urban pattern through the interactive display of ancient city sandbox and museum.

Research results: It improves the public's historical and cultural identity, promotes tourism and economic development, and forms a replicable display

experience.

Case revelation: The revelation for the study of Daur ethnic group is that digital modeling, sand table display and other methods should be used to make the wisdom of traditional settlement space intuitive and concrete, so as to enhance the public awareness of cognition and protection.



Figure 33 Case5 :A model of Changsha City during the Tang Dynasty in China

(Source: https://bbs.zol.com.cn/dcbbs/d34019_131393.html)

2.4.6 Yunnan Jinxing Village Model Planning

Background: Jinxing Village demonstrates its overall development plan through a sand table model, highlighting its role in spatial protection and cultural inheritance.

Research method: Combine cultural communication, tourism promotion and space protection, and simulate the development and functional layout of villages through sand table.

Research results: the cultural influence is enhanced, tourism and economic development are promoted, and the sustainable utilization of cultural resources is realized.

Case revelation: This case shows that visualization and modeling play a significant role in cultural heritage protection. The Daur people can promote cultural inheritance by building settlement space model and virtual exhibition hall.



Figure 34 Case6 :A model of Changsha City during the Tang Dynasty in China

(Source: <https://baijiahao.baidu.com/s?id=1772400051103566388&wfr=spider&for=pc>)

2.4.7 Sichuan Traditional Furniture and Interior Display Art

Background: Sichuan presents traditional furniture, interior art and national beliefs through a combination of online and physical methods.

Research method: The participatory exhibition method is adopted, combined with digital display and offline interaction, emphasizing the sense of participation of the audience.

Research results: It promotes the dissemination of traditional culture, forms a replicable cultural display mode, and enhances social identity.

Case revelation: The Daur settlement can learn from this experience, and realize the global communication and cross-regional inheritance of culture through online exhibition hall, VR technology and interactive display.



Figure 35 Case 7 :Exhibition of Traditional Furniture and Interior Display Art

(Source: http://www.cqwenyi.net/html/1321789572662763520/web/content_1321789572662763520.html)

2.5 Summary for Literature review

2.5.1 Research Background and Significance

Amidst accelerating globalization and urbanization, ethnic minority settlements face multiple challenges including cultural heritage loss, deteriorating living

environments, and insufficient industrial support. The Daur people, representing cold-region ethnic groups, maintain their settlement spaces that preserve social-historical memories while embodying ecological wisdom adapted to local conditions. However, modern construction methods and lifestyles have weakened traditional settlements' functionality and accelerated cultural erosion. Sustainable preservation not only safeguards cultural diversity but also directly impacts the effectiveness of rural revitalization strategies and ecological civilization initiatives. Therefore, conducting systematic research on ethnic minority settlements to summarize their cultural DNA and adaptive wisdom, while exploring new pathways for preservation and development, holds significant theoretical and practical value.

2.5.1.1 Theoretical Significance (Theoretical Significance)

1. Expanding the Academic Scope of Cold Region Settlement Studies: Current research predominantly focuses on preserving traditional villages in southern or central plains regions, while theoretical frameworks for ethnic minority settlements in cold regions remain underdeveloped across architecture, anthropology, and geography. This study fills critical gaps in cold-region settlement research by analyzing the cultural genes and ecological adaptation wisdom embedded in Daur settlement spaces, thereby expanding the disciplinary boundaries between ethnic settlement studies and sustainable architecture.

2. Fundamental Principles of Promoting Cultural-Spatial Interaction: Grounded in narratology, communication studies, and sustainable development theories, this research reveals the dynamic interplay between cultural logic and spatial structures, establishing a three-dimensional "space-cultural-society" expression model. This provides a novel analytical framework for traditional village studies while deepening the interdisciplinary integration of cultural anthropology and environmental design.

3. Enriching the discourse system of ethnic minority cultural protection: Through systematic summary of the cultural characteristics of Daur settlements, this study not only provides a localized case for the domestic cultural heritage protection theory, but also provides a new case support for the global academic dialogue on diversity and sustainable development, which has international comparative value.

2.5.1.2 Practical Significance

1. Help the implementation of rural revitalization strategy: The protection and revitalization of Daur settlements can not only preserve cultural memory, but also promote local economic development through tourism, homestay economy and cultural experience activities, providing a typical demonstration for rural revitalization.

2. Service for ecological civilization construction: The thick walls, U-shaped kang and south-facing layout of traditional Daur dwellings contain ecological wisdom of low energy consumption and strong adaptability. Translating these experiences into contemporary green building design references in cold areas will help promote green and low-carbon development.

3. Promoting cultural inheritance and social identity: With the help of digital display platforms and online exhibition halls, we can expand the channels of cultural communication, enhance the public's awareness and identity of ethnic minority culture, and provide new ways for the young generation to learn and participate in culture.

4. Provide reference for policy making and practice: The research results can provide empirical support and decision-making basis for local governments in the protection of traditional villages, the inheritance of ethnic minority culture and rural construction planning, so as to improve the scientificity and pertinence of policy implementation.

2.5.2 Domestic and foreign research status

2.5.2.1 Foreign research

In the study of ethnic minority settlement spaces, "culture-space coupling" has consistently served as a central theoretical foundation. Since the mid-20th century, scholars like Rapoport and Oliver established the fundamental framework of cultural determinism and regional adaptation, highlighting that dwellings and settlements are material manifestations of culture. Entering the 21st century, with the rise of sustainable development agendas, socio-ecological systems theory, and digital humanities methodologies, international academia has continuously deepened and expanded this theory. Particularly in recent five years, emphasis has been placed on the roles of cultural identity, ecological wisdom, digital narratives, and social participation

in settlement preservation.

1. Cultural identity and social belonging in settlement spaces

The construction of cultural identity forms the fundamental starting point for settlement space studies. As early as 1969, Rapoport proposed the "Residential Cultural Chain" theory in his seminal work "House Form and Culture", asserting that architectural forms are shaped not only by natural environments but also by religious beliefs, social structures, and ethnic customs (Rapoport, 1969/2007). This theoretical framework provides a methodological foundation for understanding settlement patterns of cold-region ethnic groups, such as Inuit igloos and Sami tents. The igloo prioritizes insulation to demonstrate family stability, while the Sami tent emphasizes migratory flexibility and communal collaboration—differences that epitomize cultural logic.

In the *Encyclopedia of World Dwellings* (1997/2006), Oliver further emphasized the importance of regional characteristics and adaptability, noting that dwellings are not merely functional structures but also serve as carriers of identity and cultural memory (Oliver, 1997). The diversity of settlements under similar climatic conditions across different cultures actually reinforces social boundaries between ethnic groups.

Nearly five years of research have further deepened this perspective. Lombard & Huxley (2019) proposed that traditional settlement spaces should be understood as "cultural performance venues," where spatial forms reinforce collective memory and social cohesion through daily activities. Bjørklund's (2020) study of Sami family campsites revealed that even with the widespread adoption of modern housing, their spatial organization still retains a "family-centered" pattern, demonstrating how cultural logic is deeply embedded in space. Friesen et al.'s (2021) investigation of Inuit communities found that although igloos are no longer used for daily living, they continue to serve as significant cultural symbols during festivals and educational events. These findings resonate with early theories by Rapoport and Oliver: space serves as both the material expression of culture and an important symbol of social identity and recognition.

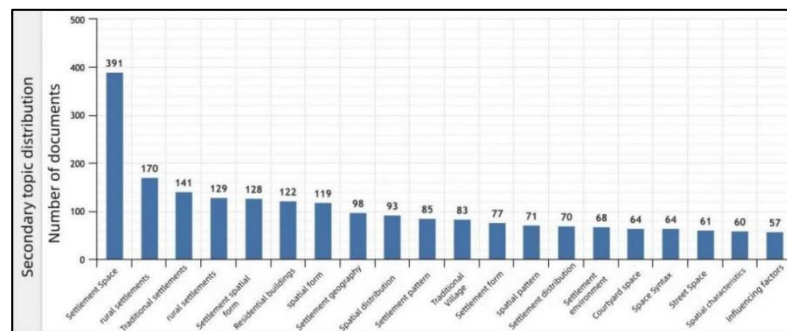


Figure 36 The bibliometric analysis results of secondary themes in the spatial settlement research of China National Knowledge Infrastructure (CNKI) database

(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

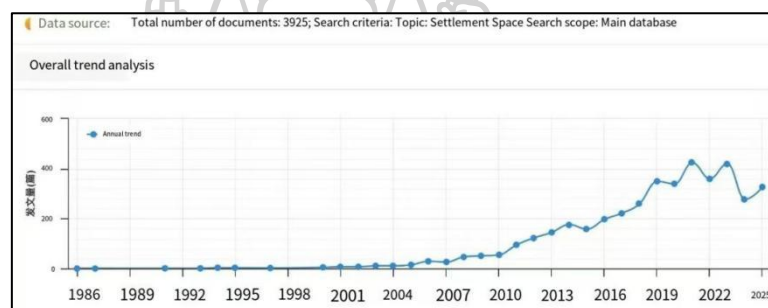


Figure 37 Annual publication trends of CNKI database research in China's knowledge network communities (1986-2025)

(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

2. Ecological wisdom and the value of sustainability

Within the framework of "cultural-space coupling", another crucial aspect is the ecological wisdom embedded in settlements. Oliver (1997) introduced the concept of "local knowledge", highlighting that traditional settlements often embody energy-saving wisdom aligned with ecological environments. Rapoport (1982,2000) further noted that human settlements are not merely the result of natural adaptation, but also carry humanity's enduring responses to resource utilization and social organization.

Empirical studies over the past five years have further validated this perspective. Moreno and Smith (2020) conducted an energy consumption analysis of Alaska Inuit semi-underground dwellings, revealing that without modern heating systems, these structures consume approximately 25%-30% less energy than conventional buildings, demonstrating the sustainability of traditional settlements in

energy utilization. Zhang et al. (2022) experimentally measured that the circular structure of Mongolian yurts effectively disperses wind pressure, resulting in significantly lower indoor temperature fluctuations compared to brick-and-timber residential buildings. This demonstrates that traditional structures exhibit superior thermal performance in cold regions.

International research on sustainable rural settlement development primarily focuses on land use and planning, ecological conservation, socio-economic development, cultural preservation with community engagement, and policy governance. This study emphasizes optimizing rural spatial layouts through rational land management and ecological protection, while promoting socioeconomic progress and infrastructure improvement. Furthermore, safeguarding cultural heritage and enhancing community participation are crucial for ensuring rural settlements meet contemporary needs while preserving future resources and achieving sustainable development.

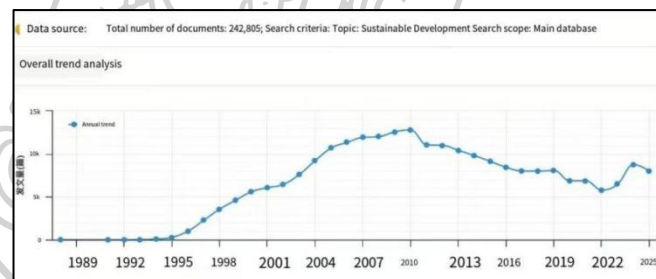


Figure 38 Annual Publication Trends of CNKI Database Research on the Ecological Wisdom and Sustainable Value of China (1986-2025)

(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

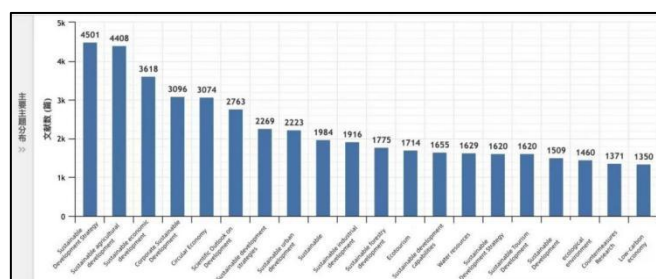


Figure 39 The bibliometric analysis results of the secondary theme "Ecological Wisdom and Sustainable Value Research in China" from the CNKI database

(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

3. New approaches to digital humanities and cultural narratives

In the late 20th century, Lawrence (1987) proposed that residential environments should be considered integral components of socio-cultural systems, where family structures and social relationships directly shape spatial configurations. From a symbolic anthropology perspective, Knapp (1986) further emphasized that spatial elements like house entrances and hearths not only serve functional purposes but also carry cultural symbolism.

Over the past five years, scholars have introduced digital humanities methodologies to this field. Champion and Rahaman (2019) proposed that reconstructing traditional settlements through VR/AR technology not only restores their physical forms but also conveys cultural significance and ritual functions via virtual environments. Liu et al. (2021) demonstrated through 3D scanning and virtual reconstruction of Sami traditional camps that digital modeling provides verifiable data for academic research while serving as a vital means for younger generations of ethnic minorities to understand their cultural heritage. Suarez et al. (2023) further proposed the concept of "digital cultural genes," emphasizing that parametric modeling and digital archives can document and transmit the cultural logic and social relationships embedded in these settlements.

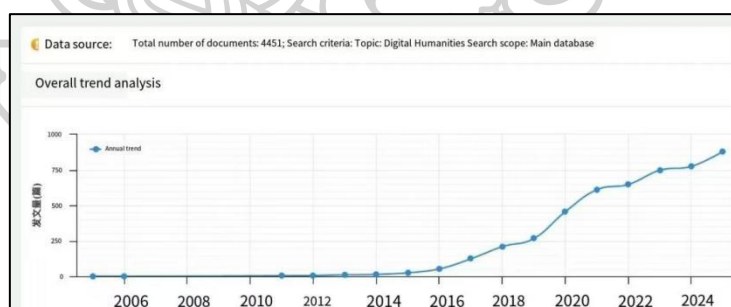


Figure 40 Annual Publication Trends of CNKI Database Research on Digital Humanities and Cultural Narratives in China (1986-2025)

(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

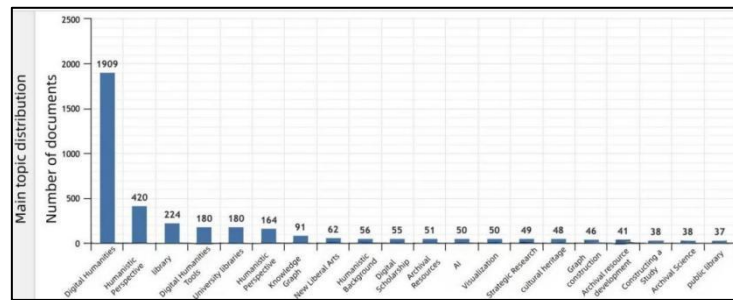


Figure 41 The bibliometric analysis results of the secondary theme "Ecological Wisdom and Sustainable Value Research in China" from the CNKI database
(Source: Data retrieved from (CNKI) Database (<https://www.cnki.net>), generated by the author, March 2024)

This trend makes the coupling of culture and space no longer limited to field observation and historical description, but enters a new stage of visualization, interaction and traceability.

4. Spatial justice and social participation

"Culture-space coupling" is not merely an academic concept but deeply intertwined with social practice. Porter et al. (2020) noted in their study of Australian Aboriginal communities that colonial history caused spatial fragmentation of settlements, yet through community-led spatial regeneration initiatives, Indigenous peoples regained control over cultural narratives. Wilson and Peters (2021) found in their research on Canadian Inuit communities that housing renewal projects neglecting cultural logic (such as the central role of family spaces) often face community resistance and low participation, demonstrating that cultural coupling is a critical factor determining the success of preservation initiatives.

This conclusion is highly consistent with the "cultural priority" emphasized by Rapoport and the "community participation" proposed by Oliver, highlighting that the protection of ethnic minority settlements needs to be based on cultural logic rather than relying solely on technology or policy.

Brief summary :Based on the classics and the research in the past five years, the theoretical development of "culture-space coupling" in foreign countries can be divided into three stages:

Classic Construction Phase (Rapoport, Oliver, Lawrence, Knapp, Glassie): Emphasizes that dwellings and settlements are material manifestations of culture, highlighting the decisive role of culture in spatial organization. Contemporary Expression Phase (around 2000): The rise of interdisciplinary approaches and socio-

ecosystem frameworks proposed principles such as authenticity, integrity, and community participation for preservation. Frontier Deepening Phase (2019–2024): Focuses on cultural identity, ecological wisdom, digital humanities, spatial justice, and multi-scale theories to form a more comprehensive research framework. For studies on ethnic minority settlements in China's cold regions (e.g., Daur), these theoretical insights remind us: the construction wisdom embodied in elements like heated brick beds and thick-walled small windows must be understood within cultural contexts rather than merely as climate-adaptive technical measures; in preservation and renewal efforts, community participation should be fully integrated while respecting cultural narrative logic; digital humanities methodologies can be adopted to establish "digital cultural gene" archives, achieving dual inheritance of culture and space; applying multi-scale and socio-ecosystem frameworks will explore sustainable pathways for settlement space preservation.

2.5.2.2 Domestic research

Regarding the WoS valid literature on "traditional villages, traditional dwellings, and traditional architecture in China" (1,498 articles retrieved from 1997 to 2024), the annual publications increased linearly from 77 articles (2017) to 155 articles (2024). A total of 8,155 traditional villages were included in the national registry; 539,000 historical and traditional buildings were protected; and 4,789 items of provincial-level or higher intangible cultural heritage were documented.

1. According to He and Zhang (2025), the research on Chinese traditional villages can be divided into three stages (Figure 91).:

1994-2008 Initial stage: The number of studies was less than 200, mainly related to housing, indoor air quality and natural ventilation. At that time, they were mostly called "ancient villages".

From 2009 to 2016: The annual average number of more than 50 papers, the research expanded to living environment, culture and settlement space, and gradually showed an interdisciplinary trend. It was supported by the National Natural Science Foundation and social Science Foundation, and the main fields were architecture, archaeology and tourism.

2017-2024 Rapid Growth Phase: The number of academic papers surged from 77 in 2017 to 155 by 2024. Driven by policy initiatives, research focus shifted from "ancient villages" to "traditional villages", with content expanding to include village landscapes, traditional dwellings, rural revitalization, and interdisciplinary

applications across economics, cultural studies, and sociology.

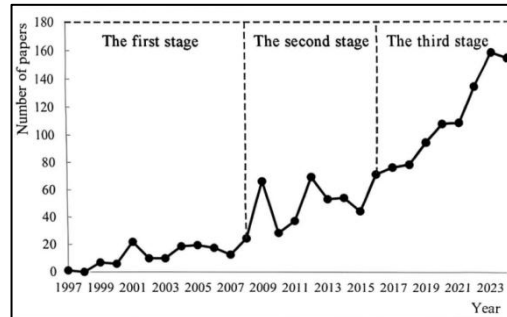


Figure 42 Annual publication volume of Chinese traditional villages.

Reprinted from (“Bibliometric Analysis of Chinese Traditional Villages Based on CiteSpace,” (Source: Yanling He & Jie Zhang, 2025))

2. Common Keywords Knowledge Graph on Chinese Traditional Villages

Using the “PathFinder” function in CiteSpace visualization software with a one-year time slice, the analysis identified 277 key nodes and 1,144 connections, achieving a network density of 0.0299. From the co-occurrence knowledge graph of traditional village (ancient village) research keywords, scholars predominantly focus on cultural landscapes (Liu, Hu, & Ma, 2019) and rural revitalization (Liao, 2018). From the perspective of rural landscape studies (Yang, Liu, & Lin, 2015) and related disciplines (Liu & Ma, 2018), several major developmental paths and trends have been identified in the integration and interdisciplinary development of this research field.

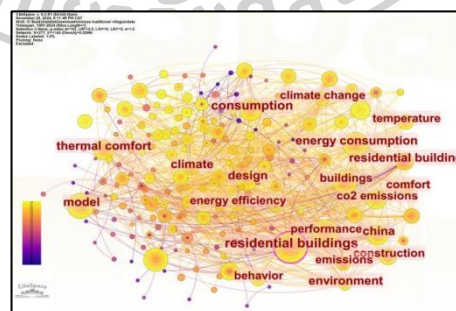


Figure 43 Cited authors network of Chinese traditional village research.

Reprinted from ((Source: Yanling He & Jie Zhang, 2025))

(1) From the Perspective of Landscape Science

Research on rural revitalization mainly revolves around themes such as cultural landscape, landscape architecture, rural revitalization, landscape design, rural tourism, and village landscape, with “cultural landscape” emerging as the most prominent and central node. The Rural Revitalization Strategy, first proposed in the report of the 18th National Congress of the Communist Party of China, emphasized the need to integrate culture into rural development. As vital components of the countryside, traditional villages embody rich material and intangible cultural heritage, serving as repositories of ecological and cultural wisdom. With the advancement of technology and research methodologies, the study of traditional villages has entered a more refined and systematic phase, gradually forming clear research pathways and implementation strategies that align with the objectives of rural revitalization.

(2) From the Perspective of Culture and Tourism Studies

Research exploring the interconnections among Beautiful Countryside, Landscape Conservation, Village Culture, Cultural Heritage, and Tourism Development reveals that the unique cultural landscapes of traditional villages function as both markers of regional identity and key platforms for sustainable utilization of cultural resources. In March 2022, six national ministries jointly issued the Guidelines on Promoting Cultural Industry Empowerment in Rural Revitalization, which emphasized that culture serves as the foundation, farmers are the principal actors, and government coordination supported by scientific planning constitutes the core mechanism. Under this policy framework, scholars have further deepened their inquiry into how traditional villages can integrate cultural heritage protection with creative industries, thereby advancing “beautiful countryside” construction and promoting cultural tourism-driven rural development.

(3) From the Perspective of Cultural Geography

In recent years, new trends have emerged in the quantitative study of traditional village spatial morphology, focusing on the integration of new technologies such as spatial syntax, landscape genes, and sustainable development. Cultural geography has been increasingly applied to the spatial and functional analysis of traditional villages, with research teams led by Liu Peilin, Li Bohua, and Dou Yindi playing pioneering roles. These scholars regard traditional villages as the landscape genes of regional cultural heritage, emphasizing the importance of identifying key spatial and cultural linkages to inform sustainable conservation strategies. The use of spatial syntax to analyze village street and alley networks has proven effective in

revealing spatial order, providing technical and theoretical support for the scientific protection of traditional settlements.

2.5.3 Literature Review

Existing research has predominantly focused on the spatial morphology, landscape genes, cultural heritage preservation, and rural revitalization of traditional villages in China (Liu Yixi et al., 2019; Luo Junhua, 2018; Yang Liguang et al., 2015; Liu Xu & Ma Ziyu, 2018). Scholars generally agree that traditional villages are not only typical carriers of regional culture but also serve as a bridge connecting cultural heritage with rural revitalization. Meanwhile, with the introduction of new methodologies such as spatial syntax and landscape genes, research has gradually entered a stage of quantification and refinement, providing new technological support for village preservation and cultural inheritance.

2.5.3.1 Research Outstanding Contributions:

Diversified disciplinary perspectives: The research spans multiple dimensions including landscape architecture, cultural tourism studies, and cultural geography, fostering interdisciplinary integration. Distinctive thematic focus: Most studies center on keywords such as rural revitalization strategies, cultural heritage preservation, and tourism development, demonstrating strong alignment between national policies and academic agendas.

Methodology is constantly updated: from qualitative description to spatial syntax, landscape genetic identification, GIS quantitative analysis and other methods, which enhance the scientific nature and practical guidance value of the research.

2.5.3.2 There are some shortcomings:

The research scope remains relatively macro: There is a lack of case studies focusing on ethnic minority villages, particularly regarding spatial characteristics of northern minority settlements like the Daur people. Practical implementation gaps exist: Most studies remain theoretical explorations, lacking deep integration with local communities, economic development, and tourism initiatives. Sustainable development perspectives are insufficient: Further exploration is needed to combine traditional village preservation with modern rural sustainable development models.

2.5.3.3 Integration review

In conclusion, the existing literature provides a solid academic

foundation for this study. On one hand, research achievements on traditional village spatial morphology, cultural landscapes, and rural revitalization offer theoretical support for constructing the "cultural model" in this paper. On the other hand, the application of new methodologies such as spatial syntax and landscape genes provides technical references for quantitative analysis and model design of Daur settlement spaces.

However, as a typical case of northern ethnic minorities, the Daur settlement still faces limited research coverage, which makes this study's topic selection innovative. Through empirical analysis of Eermenqin Village, this paper aims to fill existing research gaps by proposing a sustainable development cultural model applicable to ethnic minority villages, while exploring its implementation pathways in rural revitalization, tourism development, and cultural heritage preservation.

2.6 Summary

This chapter focuses on three core dimensions—settlement space, sustainable development scope, and design tools—systematically sorting out and integrating relevant research results to clarify the theoretical foundation and core direction of this study.

Regarding settlement space: It focuses on the formation mechanism and spatial order of Daur settlements. Relying on natural landforms such as low mountains, plains, and rivers, these settlements form an organic ecological pattern of "mountains-water-fields-grasslands-people". The settlement space includes functional zones such as farmland, residential courtyards, public nodes, and ritual nodes. Each zone is closely connected in terms of location distribution, core functions, and spatial logic—this spatial organization model not only adapts to the characteristics of the natural environment but also deeply carries the connotations of ethnic culture.

In terms of the sustainable development scope: The core of the research lies in transforming the intangible cultural wisdom contained in Daur settlements into cultural capital, and aligning it with sustainable development goals, with a focus on linking economic growth and sustainable production and consumption dimensions. It provides clear directional guidance for the living inheritance and sustainable development of settlement culture in contemporary society.

With respect to design tools: Based on the cultural expression model of "identifying cultural genes—transforming cultural expressions—disseminating cultural symbols—ensuring cultural sustainability", combined with the Iceberg Model of Culture (surface-level behavioral customs—middle-level attitudes and beliefs—deep-level spiritual concepts), a theoretical tool system supporting subsequent design practice is constructed.

In summary, through the systematic sorting out of these three core dimensions, this chapter clearly defines the theoretical framework of this study, identifies the gaps in existing research, and lays a solid foundation for the design practice section in Chapter 4.

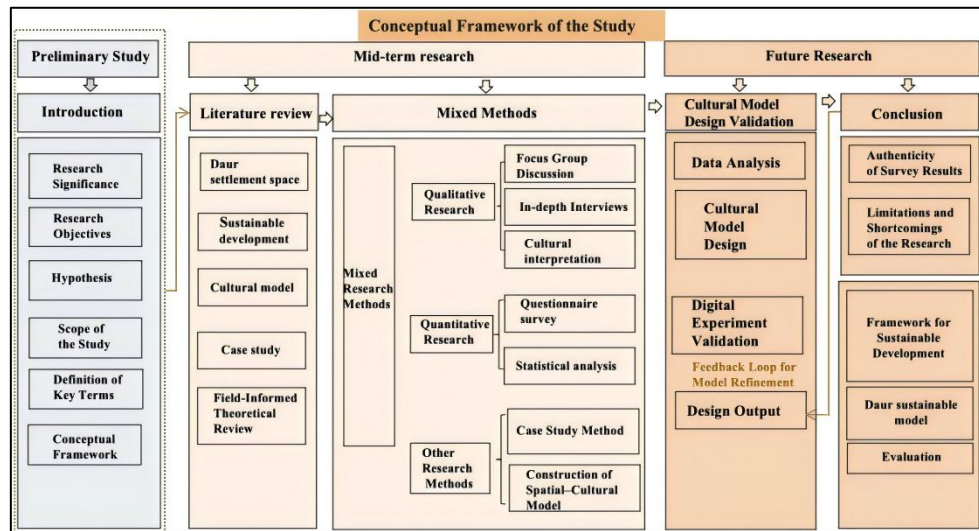
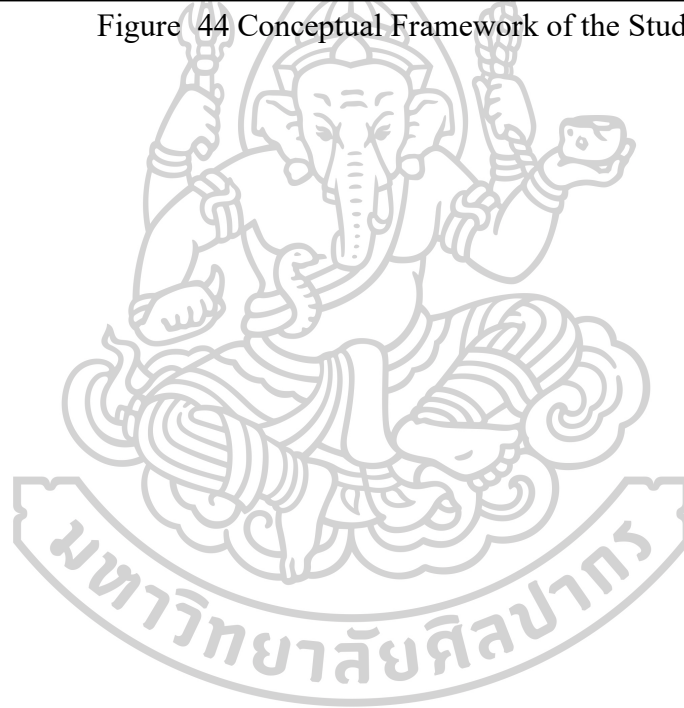


Figure 44 Conceptual Framework of the Study



CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research method

This study uses a mixed-methods approach that combines both qualitative and quantitative research to make the findings more reliable and complete.

Qualitative methods—such as interviews, field observation, and document analysis—are used to understand the cultural values and spatial characteristics of Daur settlements.

Quantitative methods—mainly questionnaires and statistical analysis—are applied to measure public understanding and acceptance of cultural elements.

The results from both methods support each other to give a balanced view of the settlement's cultural and spatial logic. In addition, design-based cultural research is used to turn the collected information into practical and visual results, such as models, exhibitions, and short videos, to help communicate and preserve Daur cultural heritage. This approach connects research, design, and cultural dissemination in a clear and practical way.

This study aims to identify the cultural features of Daur settlement spaces and apply them to sustainable cultural development and design practice. To address the above research questions, the study sets three research objectives, each corresponding to a core research stage, as follows:

Objective 1: To study and identify the cultural genes of Daur settlement spaces by conducting systematic surveys, collecting historical materials, and establishing a database to document this gradually disappearing cultural heritage

Corresponding Stage – Understanding Stage: Through observation, interviews, document study, and systematic surveys, comprehensively identify and describe the core cultural genes and spatial characteristics of Daur settlements. Use questionnaire data to verify research reliability, and simultaneously complete the collection of historical materials and the establishment of a cultural heritage database.

Objective 2: To analyze the cultural functions of Daur settlement spaces and explore their implications for sustainable development

Corresponding Stage – Analysis Stage: Adopt a combination of qualitative and quantitative data to conduct an in-depth analysis of the cultural functions of settlement spaces. Meanwhile, explore how these cultural features influence people's lives, community interaction, and public awareness, clarifying their application value and practical implications for sustainable development.

Objective 3: To design the Ermenqin Sustainable Model that integrates Daur traditional wisdom with modern needs, promoting cultural transmission, community cohesion, and local development

Corresponding Stage – Application Stage: Based on the research findings and methodological insights, materialize the Ermenqin Sustainable Model to realize the

integration of Daur traditional wisdom and modern needs, thereby facilitating cultural transmission, enhancing community cohesion, and boosting local development

This research design with one-to-one correspondence between objectives and stages makes the study both academically sound and socially meaningful.

3.2 Scope of the study

To ensure systematic and scientific rigor, this study established clear boundaries across three dimensions: spatial scope, temporal scope, and content scope. This framework not only maintains research focus and practical applicability but also lays a solid foundation for subsequent empirical investigations, data analysis, and theoretical frameworks.

3.2.1 Spatial Scope

The spatial scope of this study is limited to Ermencin Village and its surrounding settlements (such as Hala New Village, etc.) in Meris Daur District, Qiqihar City, Heilongjiang Province. The selection of this area as the main research site has many academic and practical implications:

First, E'ermenqin Village has over 60% of its population belonging to the Daur ethnic group and is recognized as a nationally protected key village. It represents a typical spatial pattern of Daur settlements, characterized by its traditional layout, cultural landscape, and distinctive residential forms. However, along with ongoing modernization and changes in rural construction, the village is also experiencing spatial transformation and cultural adaptation. This situation makes E'ermenqin Village a valuable case for studying how traditional settlement culture can be preserved, interpreted, and renewed under contemporary development pressures.

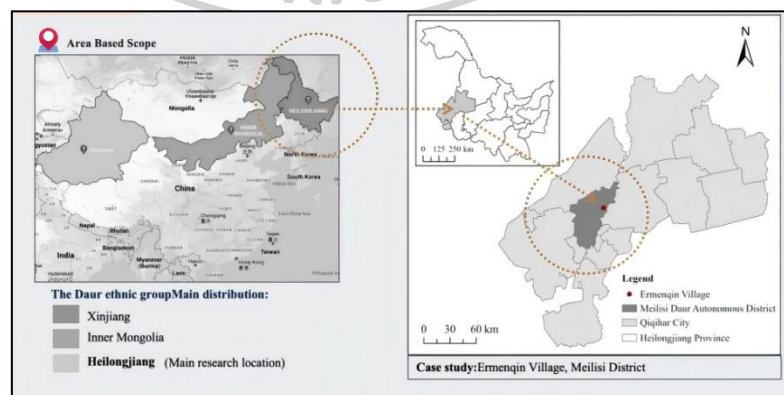


Figure 45 Location map of Eermenqin Village

Secondly, the region's severe cold climate has greatly influenced the living environment and cultural practices of the Daur people. Located in the cold temperate continental monsoon zone, the Meilisi area experiences long, harsh winters and short, hot summers. Winter temperatures can drop below -36°C , while summer highs exceed 35°C , resulting in a large annual temperature difference. These climatic conditions have shaped the settlement layout, the use of local building materials, and lifestyle patterns such as indoor heating spaces and collective winter activities. The distinctive spatial forms and living customs of the Daur settlements thus reflect an adaptive response to the cold environment and embody the community's ecological wisdom.

Table 5 Annual temperature table of northeast Daur ethnic groups

Main Populated Areas	Inner Mongolia Autonomous Region (Moridawa Banner)	Heilongjiang Province (Meris Daur Ethnic Township)	Heilongjiang Province (Longjiang County)
Administrative Division	Moridawa Autonomous Banner	Meris Daur Ethnic Township	Longjiang County
Geographical Location	The middle section of the Eastern Daxing'anling and the right bank of the Nenjiang River	South foot of Daxing'anling, right bank of the middle reaches of the Nenjiang River	Southern Daxing'anling and Pine region, transition zone of the Nen Plain
Climate Characteristics	Temperate continental climate; four seasons; abundant sunshine; moderate rainfall; windy spring rain; short summer; sunny autumn with frost; cold, dry, and long winter	Temperate continental climate; similar seasonal pattern	Temperate continental climate; short summer, long and cold winter
Average Annual Temperature ($^{\circ}\text{C}$)	1.3	0.7	0.6
Minimum Temperature ($^{\circ}\text{C}$)	-33	-34	-36
Maximum Temperature ($^{\circ}\text{C}$)	32	35	34
Annual Precipitation (mm)	450	415	469.8
Annual Sunshine Duration (hours)	2530 – 2875	2861.9	2661.1
Frost-free Period (days)	115	136	148
Freezing Period (months)	5		
Average Annual Relative Humidity (%)		63	55
Average Wind Speed (m/s)	3.5		2.9

Finally, the region boasts distinct cultural identity. As China's only ethnic autonomous area predominantly inhabited by the Daur people, Meris District demonstrates a strong presence and continuity of ethnic culture in its village layouts, festival rituals, and daily life. By selecting Ermenchin Village and surrounding settlements as research sites, this study reveals the unique regional characteristics of the Daur people's spatial cultural DNA. The findings also provide replicable models for preserving and sustainably developing ethnic minority communities.

To sum up, Ermenqin village and its surrounding settlements are highly representative in three dimensions: spatial pattern, climate environment and cultural inheritance. They are ideal places for field investigation and empirical analysis of this study.

3.2.2 Time Scope

This study covers the period from 2023 to 2025, combined with the preliminary research phase in 2022 as a preliminary accumulation. The design of the

time range follows the logic of progressive and phased research, which is mainly reflected in the following three aspects:

First, the preliminary research phase (2022). Through field visits, initial interviews, and collection of local chronicle archives, researchers established a foundational understanding of the study area. This stage not only helped them familiarize themselves with the local socio-cultural context but also provided empirical groundwork for designing subsequent research tools such as interview outlines and questionnaire items.

The second phase, the fieldwork stage (2023-2024), involved researchers conducting multiple rounds of on-site investigations over two years. These included spatial mapping of settlement areas, in-depth interviews, participatory observation, and systematic documentation of cultural activities. This phase focused on gathering firsthand data about settlement spatial structures, cultural practices, and residents' daily lives, while establishing a comprehensive database containing textual records, visual materials, and GIS data.

Finally, the data integration and validation phase (2024-2025). Building upon completed fieldwork, this study will transition into a data consolidation and model verification stage. Researchers will systematically organize and theoretically refine preliminary data through statistical analysis, comparative studies, and case-based synthesis. Concurrently, feedback validation and optimization of the proposed "Sustainable Cultural Development Model" will be conducted using questionnaire surveys and expert evaluations, ensuring both scientific rigor and practical applicability of the research findings.

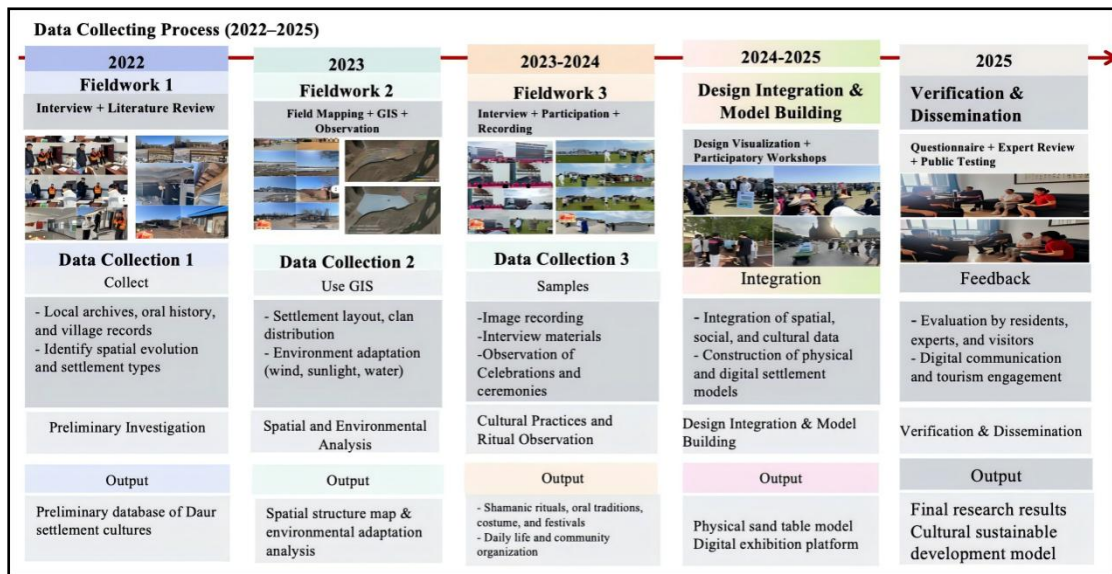


Figure 46 Time node range table

This three-stage, cross-year time arrangement not only ensures the system and continuity of the research, but also provides the possibility to observe and capture the changes of the village at different time nodes, thus improving the timeliness and dynamics of the research results.

3.2.3 Content Scope

In terms of research content, this study emphasizes the dual attention to tangible cultural heritage and intangible cultural heritage, and combines with the contemporary expression path of digital communication, which includes the following three levels:

First, tangible cultural elements. These encompass the spatial configurations, architectural forms, construction techniques, and holistic layout of traditional dwellings. For instance, south-facing lighting designs in houses, the thermal insulation properties of thick adobe walls, and the heating functionality of heated brick beds (huokang) are all recognized as spatial wisdom accumulated by the Daur people through centuries of adaptation to cold climates. These elements not only form the material foundation of villages but also serve as visible manifestations of cultural heritage.

Second, intangible cultural elements. These encompass festival rituals (such as the Spring Plowing Festival and sacrificial ceremonies), ethnic costumes, traditional dietary practices, production lifestyles (like farming and hunting), crafts, and

performing arts. As vital components of settlement life, these cultural practices are deeply integrated with spatial structures and daily routines, forming the key to understanding the cultural-spatial interaction mechanism.

Third, digital communication elements. With the development of information technology, cultural dissemination has transcended geographical and physical space limitations. To this end, this study examines the cultural dissemination in E'ermenqin Village within a broader digital context, focusing on analyzing the role of online exhibition hall construction and social media communication (WeChat, TikTok, Xiaohongshu, etc.) in promoting ethnic minority cultures. Through digital means, we can break through temporal and spatial constraints to showcase the cultural symbols and life wisdom of the Daur people to a wider domestic and international audience, further validating the feasibility of cultural preservation and sustainable development.

In conclusion, this study establishes a tripartite research framework encompassing "physical space, socio-cultural context, and digital dissemination". It addresses both the spatial cultural characteristics within settlements and their communication and application in modern social contexts. This scope of inquiry enables the research to achieve multiple objectives across three dimensions: cultural preservation, academic contributions, and practical applications.

3.2.4 Sample sampling

The scientific validity and representativeness of samples are fundamental to ensuring the reliability of research conclusions. To obtain comprehensive and representative data within limited time and resources, this study developed a multi-level sampling framework centered on stakeholders during the sampling process, integrating theoretical foundations with practical field conditions. By combining stratified purposive sampling with quota sampling strategies, we ensured alignment between sample composition and research objectives.

3.2.4.1 Sampling frame and sample composition

The sampling frame design for this study is based on the Stakeholder Theory. Stakeholders refer to individuals or groups with direct or indirect interests in the research subject, whose attitudes, behaviors, and feedback play a decisive role in determining the operational status and future development of the research object. Based on this framework, the study divides the sampling frame into three tiers:

1.The primary stakeholders

Encompass community residents, local governments/authorities, and cultural heritage conservation institutions. As the direct bearers and practitioners of Daur settlement culture, community members provide core data sources through their lifestyles, cultural practices, and spatial utilization behaviors. Local governments and administrative bodies, as key decision-makers in cultural preservation policies and rural development strategies, shape institutional environments for cultural inheritance through their attitudes and actions. Cultural heritage conservation institutions, functioning as professional organizations, play crucial roles in heritage registration, restoration, and public outreach.

2.Secondary Stakeholders

This group comprises academic researchers, experts, and professionals in the tourism and cultural innovation sectors. Academic scholars provide theoretical frameworks and methodological support for research while serving as key drivers of cultural dissemination. Tourism and cultural innovation entities play a pivotal role in transforming cultural resources into economic value, with their feedback playing a vital role in evaluating the sustainability and market adaptability of cultural models.

3.Third tier stakeholders

The third layer of stakeholders consists mainly of Douyin's observers, audiences, and visitors, interested individuals, as well as media and publishing agencies. These groups play a key role in extending the visibility and cultural influence of Daur settlements. Online audiences and individuals interested in ethnic culture contribute to cultural dissemination through viewing, sharing, and engagement on digital platforms, while media and publishing agencies construct narratives and promote cultural stories that shape public perception and awareness.



Figure 47 Sampling frame and sample composition

By classifying these three stakeholders, this study can vertically cover the chain of "identification - reconstruction - dissemination", and horizontally take into account the government, academia, industry and the public group, thereby ensuring the comprehensiveness and hierarchy of the sample composition.

3.2.4.2 Sampling method

To align with the three core research objectives, this study adopts a combined sampling approach to ensure sample representativeness, coverage, and relevance, with specific details as follows:

The study primarily employs a combination of stratified purposive sampling and quota sampling. First, the sample is stratified into five stakeholder groups: Daur local villagers, student group, tourist group, expert group, and government/community workers and others, ensuring representative individuals from core, key, and supporting groups are included. Within each stratum, purposive sampling is conducted to select individuals with typical characteristics or rich experience (e.g., traditional culture inheritors, community leaders, relevant major students, and cultural research scholars). Simultaneously, quota sampling is applied based on demographic features (occupation, age, gender) to avoid excessive concentration of samples in any single group, ensuring the sample proportion matches the actual population structure and research needs.

For the tourist group, considering the seasonality and time-specific nature of tourism activities, systematic time sampling is adopted to conduct systematic intercept surveys during festivals and peak tourism seasons, aiming to obtain representative data across different time windows. For the expert group, due to the limited size of the professional community, snowball sampling is used: key informants already contacted recommend other relevant experts to gradually expand the sample

coverage and ensure the comprehensiveness of academic perspectives.

Through the above sampling methods, the study ultimately obtained 134 valid questionnaire samples (N=134). These samples are cross-adapted to the three research objectives: 41 Daur local villagers provide first-hand local cultural and spatial usage information; 53 students offer young perspectives on cultural recognition and sustainable development; 26 tourists reflect cultural tourism experience and market demand; 3 experts provide academic and theoretical support; 11 government/community workers and others supplement policy and practical experience. To enhance research reliability, the questionnaire data is combined with interview and observation data for triangulation(The detailed sample contents corresponding to the three goals are shown in Table 6).

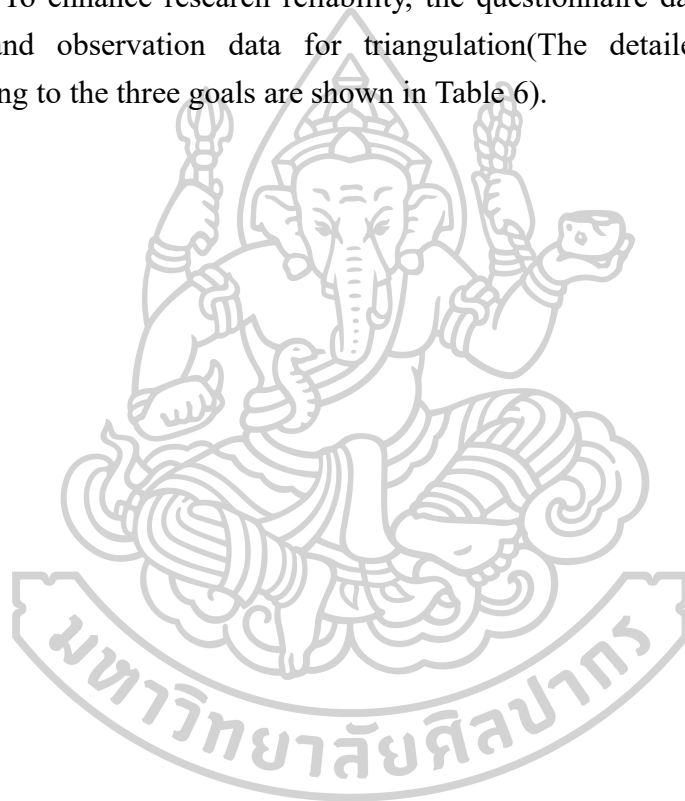


Table 6 Demographic distribution of sample population

Research Objective	Sample Group	Quantity	Percentage (%)	Allocation Logic	Objective Adaptation
Study and identify the cultural genes of Daur settlement spaces, and establish a cultural heritage database	Daur local villagers	41	30.6	Core carrier of native culture, provides first-hand information; ensures diversity of local	Provides raw materials for cultural gene identification, lays foundation for database
	Student Group	53	39.55	Young perspective representative, high accessibility and cooperation; ensures	Feeds back cultural element recognition, provides reference for younger inheritance
	Expert Group	3	2.24	Scarce professional resources; 3 people cover core academic perspectives	Defines cultural gene scope, provides academic theoretical support
	Government/Community Workers and Others	11	8.21	Familiar with policy and practice; balances feasibility and information sufficiency	Supplements policy/practice experience for settlement planning and cultural inheritance
Analyze the cultural functions of Daur settlement spaces and explore their implications for sustainable development	Daur local villagers	41	30.6	Reflects actual effect of cultural functions in daily life	Reveals impact of cultural features on community interaction and life
	Tourist Group	26	19.4	External audience of settlement culture; covers tourism experience feedback	Reflects external communication effect of cultural functions, provides market demand basis
	Student Group	53	39.55	Possesses cultural cognition foundation; represents young group's sustainable development perspective	Provides cognitive feedback on correlation between cultural functions and sustainable development
	Expert Group	3	2.24	Professional theoretical support; interprets internal logical connections	Deciphers inherent link between cultural functions and sustainable development
Design the Ermenqin Sustainable Model integrating Daur traditional wisdom with modern needs	Daur local villagers	41	30.6	Ensures model fits local needs and traditional wisdom	Guarantees local adaptability of the model
	Tourist Group	26	19.4	Feeds back tourism market demand; enhances market feasibility of the model	Provides basis for cultural tourism and sustainable consumption strategies
	Student Group	53	39.55	Injects youthful innovation perspective; facilitates model promotion	Supports young-oriented communication and innovation of the model
	Expert Group	3	2.24	Provides theoretical support for tradition-modern integration	Improves scientificity and forward-looking of the model
	Government/Community Workers and Others	11	8.21	Promotes model implementation; ensures policy adaptability	Facilitates model landing, guarantees community participation and policy matching
Total	-	134	100	-	-

This sample structure not only reflects the actual population composition, but also reflects the diversity and balance required by the study.

3.2.5 Settlement space Analysis

3.2.5.1 Ethnic characteristics and settlement features

Settlements represent complex and dynamic systems in which spatial configurations embody the symbiotic interactions among natural, socio-economic, and cultural subsystems (Strano et al., 2020). Within this intricate framework, three fundamental components—the natural environment, socio-economic structure, and cultural attributes—serve as the key determinants influencing both the stability and transformation of traditional settlement systems. When any of these elements undergo change, the entire system responds through a process of self-adjustment and coordinated evolution, enabling interdependent subsystems to realign and reach a new state of equilibrium (Strano et al., 2020). This dynamic relationship illustrates that natural, social, and cultural forces not only drive the evolution of settlements but also act as critical catalysts for achieving systemic stability.

The traditional dwellings of the Daur people embody a profound body of spatial cultural wisdom, reflecting the community's adaptive strategies and harmonious coexistence with the natural environment. These settlements are not merely physical spaces for habitation and production but also serve as living symbols of cultural memory, social organization, and spiritual belief, representing an essential component of the traditional settlement culture of China's cold-region ethnic groups.

However, with the accelerating process of modernization, the spatial integrity and cultural authenticity of many traditional Daur settlements are gradually being eroded. To better understand the cultural logic and ecological intelligence embedded in Daur settlement spaces, this study approaches them from the perspective of spatial cultural systems, focusing on how settlement structures, architectural forms, and cultural expressions reflect the holistic worldview of cold-region adaptation and ethnic identity.

This section, based on documentary analysis and field investigations, explores the key variables influencing the formation and continuity of spatial culture in Daur settlements. The research was conducted between 2022 and June 2024 in the Meilisi Daur Autonomous District of Qiqihar City, Heilongjiang Province, examining three major factors—natural environment, socio-economic conditions, and cultural customs—to establish a foundation for the subsequent analysis of the spatial cultural model and wisdom system of Daur settlements.

3.2.5.2 Formation and development of traditional Daur settlement space

The natural environment of the Daur people plays a decisive role in shaping the formation and development of their traditional settlements. As a complex and adaptive system, a settlement's spatial organization is profoundly influenced by geographical location, topography, climate, and resource availability. The geographical location determines the overall spatial distribution and settlement orientation; the topography affects the settlement pattern, elevation selection, and architectural layout; climatic conditions guide adaptive construction techniques and the seasonal rhythm of habitation; and ecological resources—including water, vegetation, and arable land—support the sustainability of community livelihoods. These interdependent environmental factors collectively define the structural characteristics of Daur settlements, illustrating the intrinsic interconnection between natural conditions, social organization, and cultural expression (as shown in Figure 48: Daur Natural Environment Analysis).

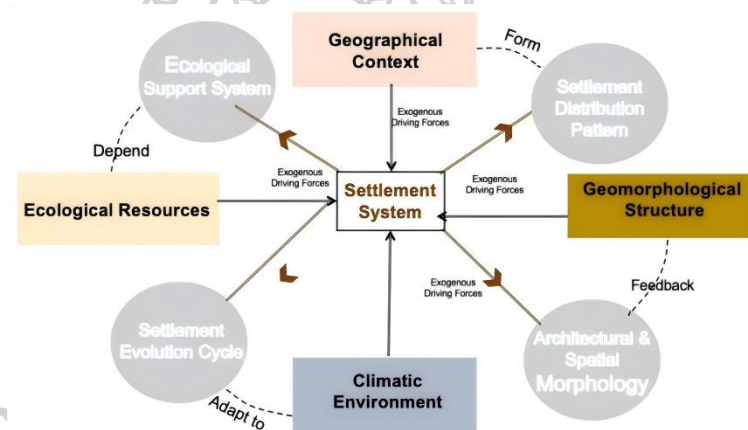


Figure 48 The Influence of Four Elements of Natural Environment on the Daur Settlement Space

The settlement patterns of the Daur people have evolved through continuous adaptation to their natural environment. Terrain and landform exert a profound influence on the shaping of ethnic living spaces, directly determining the availability of resources and modes of production that, in turn, define settlement structures and spatial characteristics. Across their three major historical migrations, the Daur people consistently relied on mountains, rivers, and farmlands as the foundation of survival, gradually forming a unique spatial pattern in which water serves as the lifeline, mountains provide natural protection, grasslands enable expansion, and forests act as ecological buffers. The Daur living environment features a diverse topography encompassing mountain ranges, plains, grasslands, rivers, and lakes, together forming a harmonious ecological system that supports the coexistence of agriculture, fishing, animal husbandry, and hunting. This interconnected landscape reflects the Daur people's ecological wisdom in harmonizing human activity with natural geography (as illustrated in Figure 49: Daur Natural Spatial Pattern).

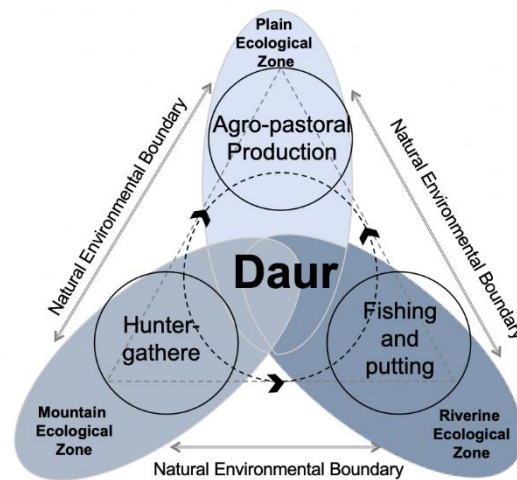


Figure 49 The natural spatial pattern of the Daur ethnic group

Since the mid-Qing Dynasty, the Daur people have predominantly inhabited the Nenjiang River Basin, occupying an area that extends across the eastern foothills of the Greater Khingan Mountains to the middle and lower reaches of the Nen River. Situated between 47°–49° N latitude and 122°–126° E longitude, this region possesses distinct topographical diversity and ecological advantages.

The terrain exhibits a northwest-high to southeast-low gradient, gradually transitioning from the shallow mountainous zones of the Greater Khingan foothills to gently undulating hills and open plains. The average elevation across the region is approximately 400 meters, with the highest point reaching 638.3 meters (Inner Mongolia Local Documentation Network, n.d.).

Based on ArcGIS elevation data analysis (See Figure 50: Daur Ethnic Elevation Analysis Map), the average elevation of Daur settlement locations within the Nenjiang River Basin is around 213 meters, indicating a preference for moderate-altitude terrains that balance accessibility and environmental stability. The highest elevation was recorded in Halkouzi Village at 394 meters, while the lowest occurred in Mohu Village at 142 meters. This spatial distribution reflects the Daur people's adaptive strategy in settlement site selection, harmonizing ecological suitability with agricultural productivity.

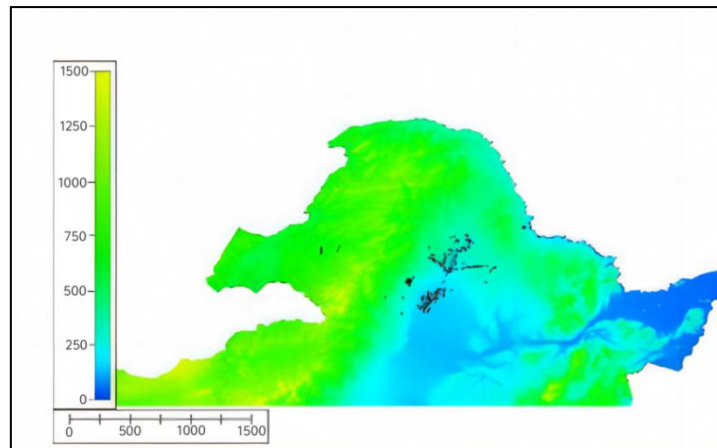


Figure 50 Altitude analysis of the Daur people

After nearly four centuries of settlement in the Nenjiang River Basin, they adapted to the temperate continental monsoon climate, forming a belt-shaped settlement pattern along the river system.

Climatic variations between the upper, middle, and lower reaches of the Nen River created diverse spatial and architectural forms. Under this environment, the Daur developed climate-responsive dwellings and integrated agro-pastoral systems, maintaining a distinctive lifestyle and cultural identity while achieving harmony between humans and nature.

3.2.5.3 Material structure of traditional Daur settlement space

The Daur settlement represents a complex adaptive system shaped by three primary variables: natural environment, socio-economic conditions, and cultural customs. The interplay of these internal and external forces has gradually formed its distinctive spatial configuration, where the physical space functions as a medium for preserving and transmitting cultural heritage.

This study investigates the material spatial structure of Daur settlements in Northeast China through three spatial dimensions: human–nature relationships, social interactions, and family systems (as illustrated in Figure 51). It examines the ecological landscape framework, productive settlement patterns, and residential spatial configurations, aiming to reconstruct historical spatial prototypes as a basis for adaptive regeneration. The findings contribute to developing structural frameworks and practical strategies for the preservation and revitalization of Daur cultural landscapes.

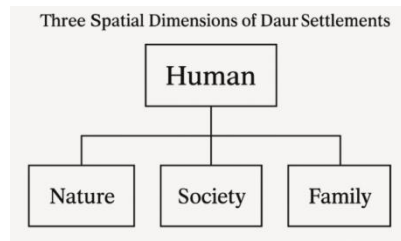


Figure 51 Spatial dimensions of Daur settlement formation

The settlement spatial model refers to the clustered residential structures formed by human communities within specific natural environments. Since the establishment of the Daur as a distinct ethnic group, they have maintained a fixed settlement lifestyle characterized by a “settlement–dwelling” model, which integrates human–agricultural activities and residential spaces (Wu, 2020).

The origin of this model can be traced back to the Liao Dynasty, when numerous historical records described Khitan military encampments, offering early evidence of settled spatial organization. After the Daur migrated to the Heilongjiang River Basin, they continued a semi-agricultural, semi-hunting, and semi-fishing mode of production. Russian colonial-era accounts also noted that “the Daur people were settled communities engaged in both animal husbandry and agriculture,” confirming their long-standing attachment to stable settlement forms.

Through this process of adaptation, the Daur developed a distinctive spatial pattern featuring “mountain–water integration” and “riverbank farmland cultivation.” This configuration demonstrates the coordinated utilization of mountains, rivers, and plains, forming a harmonious productive landscape. Within this natural framework, daily production activities shaped a residential spatial system structured around mountains, waterways, fields, grasslands, and human settlements (as illustrated in Figure52: Settlement Spatial Model of Ermenqin Village).



Figure 52 Spatial pattern of settlement in Ermenqin Village

The Daur people establish their settlements on alluvial plains adjacent to low mountains and river systems, forming a unique spatial configuration that integrates five interrelated systems: mountains, waterways, farmlands, grasslands, and human communities. This integrated mountain–water–grassland–human system constitutes the living landscape of the Daur people, in which each component is mutually dependent and ecologically complementary.

Using Ermenqin Village as a case study, the spatial analysis map illustrates how the Daur settlement structure is organized and sustained through the interaction of these five systems, reflecting a holistic ecological model that unites production, habitation, and cultural continuity (As shown in Figure 53: Spatial Structure of Daur Settlements).



Figure 53 Spatial structure of Daur settlement

1. Production Settlement Space in the Social Dimension

The settlements of the Daur ethnic group—often referred to as “village clusters”—are formed through kinship-based cohesion and production-oriented clustering. Over time, these communities developed spatial arrangements that reflect both social organization and productive functions. While each Daur settlement appears to follow a well-planned layout, a deeper analysis reveals a dual structural logic in which clan organization and economic production systems jointly determine and regulate spatial form.

(1) Spatial Organization of a Single Settlement

Each individual settlement exhibits a distinct spatial organization shaped by both environmental factors and social relationships. The arrangement of houses, courtyards, and public spaces reflects kinship connections, labor collaboration, and production needs. Historical records show that during the 1650s, the Daur people migrated to the Nenjiang River Basin, where they established surname-based

settlements located near mountains and waterways, forming a characteristic spatial pattern.

Since the 1980s, with the implementation of China's New Rural Construction Initiative, many Daur villages have undergone demolition and reconstruction. Although modernization has improved living conditions, the authentic spatial texture of traditional Daur villages has gradually disappeared. Field investigations and interviews with local officials and villagers indicate that while most streets and buildings have been renovated, the original spatial framework remains largely unchanged. The planning map of Ermenqin Village (see Figure 54: Received Planning Map of Ermenqin Village) still reveals orderly street layouts, a clearly defined transportation network, and vertically extended courtyards arranged in parallel horizontal rows.

Therefore, research on traditional Daur village planning and layout should combine current spatial evidence with historical documents and oral histories, enabling a reverse and retrospective reconstruction of settlement patterns. In Ermenqin Village, the spatial planning demonstrates a clear hierarchical structure and functional zoning, embodying the Daur people's systematic spatial logic and collective production wisdom.

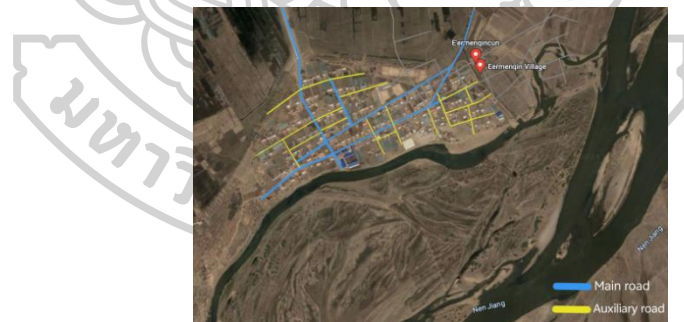


Figure 54 Planning map of Ermenqin Village

(Source: <https://www.google.com/maps>)

Field research and oral accounts reveal that Daur settlements were strategically planned by respected elders or Mokunda (traditional leaders), rather than formed naturally. After site selection, communities divided residential, grazing, and farming areas according to terrain, creating a functional layout of “vast fields, nearby pastures, and a village at the core.”

The street system typically included 1–3 main avenues (10–15 m wide) and smaller lanes (5–10 m wide), forming ribbon-like residential patterns. Courtyard houses were rectangular, north–south oriented, and arranged front-to-back, each containing 3–5 wells and side-by-side gardens shared by related families.

This spatial design met agricultural and pastoral needs while embodying the Daur principles of equality, communal ownership, and harmonious order (See Figure 55).



Figure 55 Model of village dwellings in Daur Museum and courtyard cad based on oral reconstruction

(2) Spatial Deep Structure of Multi-level Economic Forms

The spatial organization of Daur settlements is shaped by multiple economic activities, including agriculture, animal husbandry, and handicrafts, which are spatially distributed in an orderly and hierarchical pattern, forming a multi-level production structure.

① Residential Living Space: As the core of communal life, residential areas accommodate both domestic and public functions. Daur settlement architecture is structured around streets as the main framework, lined with rectangular courtyards arranged in sequence. Within the traditional “Beigong” social unit system, families maintain strong kinship cohesion, relying on self-sufficient economic activities with limited dependence on commercial spaces. Consequently, dwellings display simple, homogeneous, and linearly distributed layouts without rigid hierarchies.

Influenced by Shamanistic beliefs and ancestor worship, public facilities such as Wobao ceremonial compounds and communal burial sites are interspersed within residential areas. Together, these linear street networks, courtyard

dwellings, and dispersed ritual spaces constitute the fundamental residential framework of traditional Daur settlements (See Figure 56).



Figure 56 Daur settlement living space

(Source: <https://www.google.com/maps>)

The above excerpt is derived from the oral interview with Teacher An, which, together with field investigations in Ermengin Village, confirms that the original ritual and communal spaces have entirely disappeared.

② Economic Dimensions of Productive Space:

The Daur people have traditionally relied on agriculture as their primary livelihood, integrating pastoralism, hunting, and fishing into a comprehensive production system. Settled village communities feature fixed agricultural and pastoral zones, reflecting the balance between subsistence and spatial organization.

The pastoral zone, situated closest to residential areas, combines free-range grazing and livestock domestication. During spring and summer, herds are driven to rotational grasslands under designated caretakers; in autumn and winter, livestock are penned within courtyards, forming a semi-sedentary grazing system adjacent to the village.

Agricultural zones lie farther away, primarily cultivating fast-growing crops that require minimal field maintenance aside from planting and harvesting (See Figure 57). To prevent livestock intrusion, farmland is often established up to five li from settlements, forming a distinct agricultural belt separated from residential areas. In addition, hunting and fishing constitute vital components of Daur economic life. Historically, due to abundant animal and aquatic resources, the Daur lacked fixed hunting grounds. From nearby streams to distant rivers, and from grassland plains to forested mountains, all served as flexible hunting territories. These mobile

production spaces often overlapped with agricultural and pastoral zones, forming the most extensive and dynamic subsystem within the Daur village economy (Wu, 2020).



Figure 57 The hunting scene of the Daur people

(Source: <https://www.google.com/map>)

③ Spatial Order Shaped by Social Institutions

English Version

The clan organization system exerted a profound influence on the spatial order of Daur settlements. It not only regulated land use and residential modes but also shaped the layout of public facilities and the distribution of social resources.

A. Settlement and Community Spatial Patterns

The formation of permanent settlements required the construction of communal compounds and dwellings for long-term habitation. The Daur people developed a hierarchical kinship system known as “Hala–Mokun–Begong”, which established an implicit social-spatial order. When Hala served as the dominant unit, Hala-style settlements emerged; when Mokun functions prevailed, they evolved into Mokun-style settlements. Both models reflected kinship-based organization. As the clan system declined, these settlements gradually transformed into geographically defined village clusters composed of Begong family units (Wu, 2020).

B. Hala-style Settlements (13th–17th century)

In the Heilongjiang River Basin, Daur clans sharing the same surname lived together in Hala-style settlements, with a central ancestral village (zongtun) and multiple subsidiary villages (zitun) along riverbanks. Land, pastures, and farmlands were collectively owned and used for both grazing and cultivation. With the

Qing government's administrative reforms, these Hala-based structures gradually disintegrated, paving the way for the Mokun-style settlement system.

C. Mokun-style Settlements (17th–19th century)

Under the Mokun system, kinship remained the organizing principle, but social authority shifted from the Hala to the Mokun level. Communal ownership persisted within smaller family groups. However, with the Qing dynasty's land reclamation policies and the influx of Han settlers, ethnic integration accelerated, leading to the decline of traditional kinship settlements and the emergence of territorially defined communities.

D. Geographical Settlement Patterns (Late Qing–Modern period)

As the Mokun system dissolved, migration and intermarriage led to multi-surname and multi-ethnic cohabitation. Settlements evolved into geographically clustered villages, characterized by mixed populations and new spatial configurations distinct from earlier forms. The disintegration of clan institutions, shifts in social ideology, and the transition from collective to household-based economies collectively reshaped the settlement structure.

The evolution of Daur settlements reflects the transformation of social institutions—from Hala-style to Mokun-style, and eventually to village-type settlements. These institutional shifts provided an invisible framework governing spatial organization. The “Hala–Mokun–Begong” clan hierarchy embodies the transition from kinship-based to territory-based spatial relations, where the interaction between social institutions and economic production generated a complex network of productive settlement spaces characterized by a symbiotic relationship between humans and society.

④ Living and Residential Spaces in the Family Dimension

The architectural evolution of Daur dwellings can be traced to the Khitan Liao Dynasty. During their nomadic period, early settlements relied on felt tents as primary shelters (Chen, 1963). As the Khitan gradually adopted Han Chinese agricultural culture, they transitioned into semi-nomadic communities, constructing thatched huts and plank houses as fixed dwellings.

In the Heilongjiang River Basin, traditional customs persisted, with rural settlements continuing to use tents—“small Wulusi tents numbered in the dozens,

while large ones exceeded a thousand” (Ding, 2004). Meanwhile, fortified castle settlements featured wooden houses with “well-constructed frames and handmade paper window linings” (Institute of Far Eastern Studies, 1977).

After relocating to the Nenjiang River Basin, the Daur people—under the dual influence of Manchu and Han residential cultures—developed earth-and-wood structures with ridge-raising horse-frame roofs, representing the maturity of their traditional architecture. The transformation from mobile tents to permanent timber–earth dwellings marks a fundamental shift from nomadic “wandering residence” to sedentary “permanent residence”, symbolizing the stabilization of the Daur family-based habitation system.

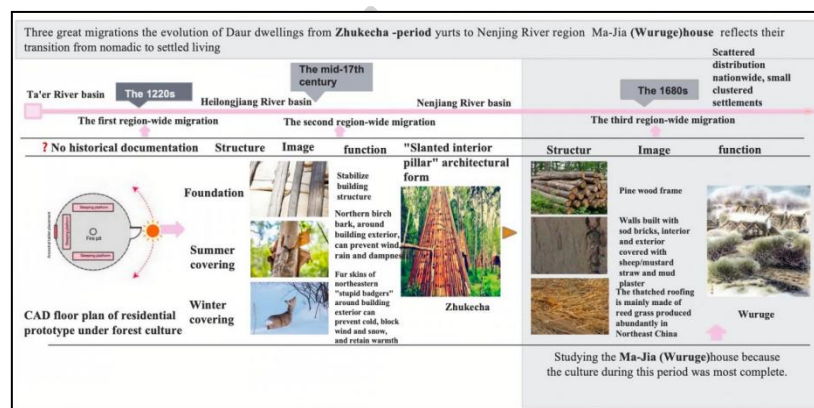


Figure 58 Evolution of Daur residential buildings

⑤ The Majiafang: Architectural Evolution and Cultural Characteristics

The Majiafang, a sophisticated residential type developed by the Daur people after their migration to the Nenjiang River Basin, exemplifies the integration of climate adaptability and ethnic cultural identity. When relocating to this region in the 1650s, the Daur people introduced their ancestral Heilongjiang-style grass-roofed plank houses and courtyard layouts. Through centuries of refinement and adaptation to local climatic conditions, these prototypes evolved into a mature and standardized dwelling system.

As the quintessential Daur house, the Majiafang represents a significant advancement over earlier grass-roofed houses, both in its technological sophistication and structural versatility. For centuries, it has been widely adopted across Daur communities, serving not only as main residences and east–west wing houses, but also as granaries, workshops, and mills among lower-income families.

A. Architectural Characteristics:

The Majiafang typically adopts a transverse rectangular plan, spanning two to three bays. The interior layout incorporates fire-heated kang (traditional heated brick beds) along two or three sides, forming a compact and thermally efficient spatial configuration. Its wooden framework—comprising columns, beams, purlins, and rafters—is constructed with locally sourced materials such as

tapered stones and reed turf, replacing the rammed earth or full-timber walls typical of the Heilongjiang period.

The roof adopts the ancient “Jie (介)”-shaped double-slope ridge design, retaining the thatched roof and earthen walls reminiscent of primitive cottage forms. Architectural features such as multiple windows, independent chimneys, and west-facing openings collectively enhance ventilation, lighting, and heat retention, embodying a refined balance between functionality and environmental adaptation.(See Figure 59: Exterior and Structural Details of the Majiafang House).



Figure 59 Exterior form and internal structure of the stable

Over centuries of evolution, the Daur dwellings have undergone a continuous transformation—from the primitive “Lakcha” tents to thatched huts and plank houses, ultimately developing into the distinctive horse-frame house (Majiafang). This architectural form embodies the Daur people's cultural memory, ecological wisdom, and technical adaptation, demonstrating the harmonious integration between ethnic tradition, natural environment, and construction technology. As the best-preserved traditional prototype, the Majiafang not only represents a crucial object of study in Daur architectural culture but also serves as an invaluable reference for contemporary sustainable design and cultural heritage preservation.

B. Plan Structure and Spatial Organization

Typical Daur residential architecture consists of a main house (Yazenggeri) and side rooms, both adopting the Majiafang structural framework. The main house is positioned at the center of the courtyard, facing south with its back to the north, while side rooms extend symmetrically along the central axis. Because the side rooms share identical form, materials, and layout, this study focuses primarily on the main house as a representative prototype. Based on field investigations of century-old

dwelling in Kuruqi Township, this section analyzes the plan configuration, construction techniques, architectural aesthetics, and spatial functions of Daur residential spaces.

In Daur language, the main house is known as “Yazenggeri.” The structure follows a compact rectangular plan, typically consisting of two or three bays, while five-bay layouts are rare. The walls, averaging 0.5 meters thick, are designed for thermal insulation during harsh winters. In two-bay configurations, the eastern bay serves as an entrance hall and kitchen, with stoves placed on the west side of the entrance and the east side of the north wall. A pool-style heated floor (Kucong Kang)—used for drying grains—connects to the western stove through an internal flue system (See Figure 60.61.62). Water jars and pickling containers are typically arranged along the east wall.

The western bay functions as the bedroom, featuring an interconnected “Wanzikang” heated floor extending along the south, north, and west walls. The heated floor connects to the kitchen stove via an indoor hot-air duct and vents through external flues linked to an independent tall chimney. A crossbeam above the bedroom ceiling is traditionally used for hanging infant cribs. The east and west rooms are separated by a wooden partition carved with auspicious floral and bird motifs, representing both decorative artistry and symbolic protection (See Figure 63).

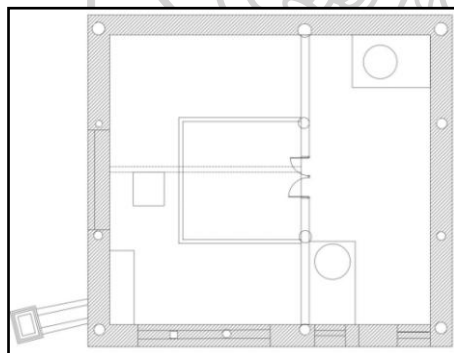


Figure 60 Two-door plane

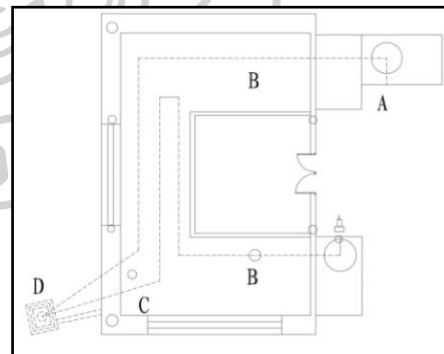


Figure 61 Hot gas channel under the kang hole



Figure 62 Storage capacity kang Figure 63 Indoor library partition mountain

In the three-bay layout (See Figure 64), the central bay is relatively narrow and functions as the foyer and kitchen. Compared with the two-bay arrangement, it features an increased number of stove platforms, with stoves installed on both the eastern and western sides of the entrance to meet the heating and cooking needs of multiple households. The eastern and western bays serve as bedrooms, yet their internal organization varies according to family hierarchy and living customs.

The western bay, generally reserved for elders, replicates the configuration of the two-bay layout, including interconnected heated floors (kang) along the south, north, and west walls. The eastern bay, more flexible in function, may contain either three-sided kang beds, two-sided kang beds with stove platforms, or partitioned spaces along the north wall. While families often adjust internal layouts to suit their preferences, the eastern bay typically serves as the living space for younger family members or guests, reflecting a spatial hierarchy embedded in generational relations.

The five-bay layout (See Figure 65) represents a structural evolution of the three-bay plan. This configuration extends the depth of the original structure and introduces a transverse partition wall between the east and west rooms, dividing them into front and rear sections. Although relatively simple in form, this spatial adjustment effectively increases the occupancy capacity and accommodates larger multi-generational households. The evolution from two-bay to five-bay layouts illustrates the adaptive logic of Daur domestic architecture—expanding spatial organization in response to family size, social hierarchy, and climatic adaptation.

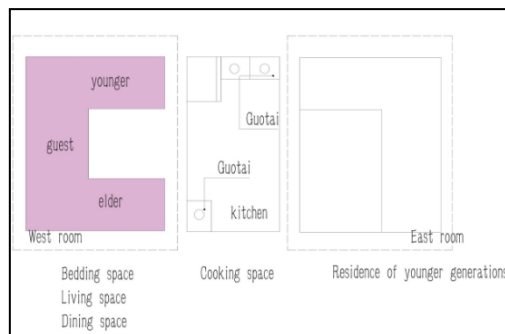


Figure 64 Three-bay plan

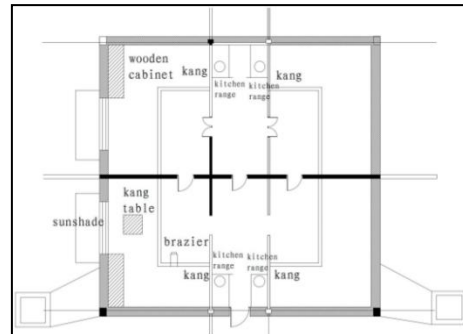


Figure 65 Five-bay plan

C. Architectural Design of the C-Ma Clan House

The traditional Daur main house of the C-Ma Clan exhibits an ancient and rustic structure characterized by the “Jie (介)”-shaped roof ridge. Its walls, constructed from pale yellow rammed earth, convey a primitive yet enduring aesthetic. The southern façade features a central entrance door flanked by a series of large rectangular windows, allowing ample sunlight into the interior. The western façade contains a single west-facing window at its center, while the northern and eastern walls are generally left windowless to minimize heat loss during harsh winters.

The roof employs a double-sloped ridge configuration, covered with thatched grass, which produces a layered texture often described as resembling “earthen steps.” This combination of thatched roofing, earthen walls, and low-slung profile reflects the Daur people’s harmonious adaptation to cold-region ecology and their emphasis on simplicity, warmth, and practicality in domestic architecture.(See Figures 66 and 67)



Figure 66 Centennial dwellings of the Daur people in Hala New Village

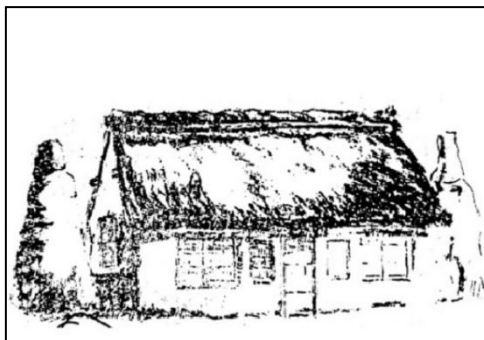


Figure 67 The form of "thatched roofs and earthen steps" of the Daur people's dwellings (Source: The Data Collection of the Daur People, Volume 8)

Based on field studies of residential buildings in the Daur Museum, supplemented by historical literature and oral records, the morphological characteristics of traditional Daur dwellings can be summarized in three main aspects:

A. The West Window (See Figure 68)

A defining feature of Daur dwellings is the large square window located at the center of the west wall, serving dual functions of ventilation and enhanced daylighting during winter. This architectural element not only meets practical needs but also embodies continuity of cultural tradition.

Historically, the Khitan ancestors of the Daur people oriented their dwellings eastward, with a south-facing window as the primary source of light. After migration to the Heilongjiang River Basin, influenced by Manchu architectural traditions, the house orientation shifted to south-facing, and the original south wall became the west wall. Consequently, the south-facing window evolved into a west-facing window, forming a distinctive and symbolic feature of Daur vernacular architecture.

B. The Independent Chimney (See Figure 69)

Unlike most northeastern ethnic dwellings, which place chimneys directly on the roof, Daur houses employ independent, freestanding chimneys built separately from the main structure. Their placement is determined by the eave width and fire-prevention spacing.

According to oral accounts by Ao Haozhang, Secretary-General of the Daur Studies Association, the chimney typically extends 30°–45° outward from the inner corner pillar, projecting 1.5–2 meters to connect the indoor kang flue with the external chimney outlet. The number of chimneys corresponds to the number of main rooms: in two-bay houses, a single chimney is positioned on the west wall, while three-bay houses feature one chimney on each east and west side.

Constructed primarily from adobe bricks and sometimes topped with hollow wooden beams, these conical chimneys represent both functional ingenuity and cultural symbolism, forming one of the most recognizable visual markers of Daur architecture.

C. South-Facing Windows and “Horse Windows” (see Figures 70–71)

Traditional Daur main houses emphasize maximum daylight utilization through large south-facing windows, adapted to the cold northern climate. In a three-bay structure, both the eastern and western bays contain three large windows along the southern façade. The upper sections are designed with dense straight-lattice frames, while the lower parts feature square-lattice panels.

The central bay includes the main entrance, flanked on both sides by narrow vertical “horse windows” (machuang). Together, these openings improve indoor illumination, ventilation, and thermal comfort, illustrating the functional adaptation and aesthetic coherence of Daur architecture within the harsh climatic context of Northeast China.



Figure 68 The west window of the traditional dwelling of the Daur people



Figure 69 The chimney of the traditional dwelling of the Daur people

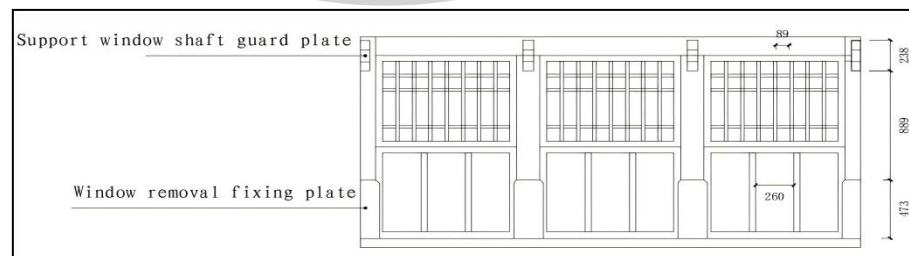


Figure 70 Three large Windows on the south facade

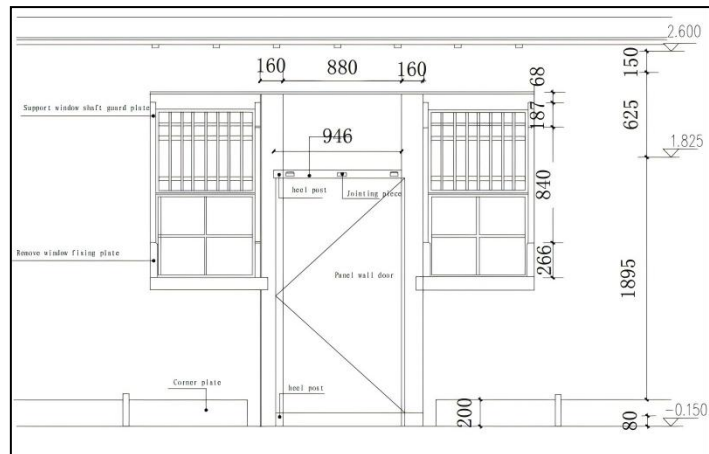


Figure 71 Entrance of the south façade

Daur dwellings are climate-adaptive structures integrating Han-style timber frames with local building wisdom. Using materials such as rammed earth, wood, and reeds, they achieve a rustic yet practical architectural expression suited to the cold Northeast climate.

Construction: Rammed-earth foundations are arranged by house width—six post holes for two-room and eight for three-room dwellings, each 0.6–1.0 m deep with stone footings. Wooden columns are coated with pine resin, wrapped in birch bark, and compacted with lime and soil for moisture and frost resistance.

Structure: Six or eight load-bearing columns support main and secondary beams, forming a rectangular wooden frame (see Figure 72). The structure relies entirely on mortise-and-tenon joints, without nails, showcasing refined carpentry. A double-purlin system includes a central beam for hanging cribs and utensils (see Figure 73), blending technical function with domestic symbolism.



Figure 72 Schematic diagram of beam frame structure

(Source: Volume 8 of Daur Ethnic Data Collection, 2024)



Figure 73 Crossbeam of the rocking cradle

The Daur people exhibit remarkable local adaptability in material selection, creating dwellings that combine practicality and rustic aesthetics.

Wall Construction: In the Heilongjiang River Basin, early dwellings primarily used timber or full-wood structures. After migrating to the Nenjiang River Basin, the Daur gradually adopted earth-wood composite walls. According to Professor An, clay mixed with grass—known as *tatou*—was cut into blocks and hammer-compacted to form solid walls. The grass roots interlocked with the clay, strengthening the structure as it dried. Exterior walls were smoothed with sheepweed and mud, while interiors were finished with fine sand for surface refinement. Wooden poles were inserted into both ends of wall pillars, integrating the earthen wall with the wooden frame for enhanced stability (See Figure 74). Whether on plains or in mountain regions, Daur builders skillfully used local materials to create sturdy, warm, and cold-resistant dwellings, showcasing the ingenuity of northern earthen architecture.

Roof Materials: Thatched roofs are a defining element of Daur dwellings. During construction, willow mats are placed over rafters, followed by a 3.3 cm layer of sheepweed and mud for insulation. Multiple layers of straw thatch, each about 0.6–0.7 m thick, are then applied from eaves to ridge, compacted with mud between layers and fixed using saddle-shaped wooden ridge frames (see Figure 75). This traditional “earth-thatch house” system, utilizing raw and natural materials, embodies the authentic texture and color of earth, wood, and grass, reflecting the Daur people's harmony with nature and their distinct vernacular charm.



Figure 74 White birch crossbar structure

(Source: Literature "Study on Traditional Settlement Space of Daur Ethnic Group in Northeast China", 2024)



Figure 75 Thatched roof laying

(Source: Literature "Study on Traditional Settlement Space of Daur Ethnic Group in Northeast China", 2024)

Spatial Characteristics: The architecture of the Daur people has evolved from tent-like "Lakcha" to the mature Jiezi-shaped main house "Yazenggeri". With advancements in exterior design and construction techniques, interior spaces have also matured. Early dwellings lacked clear spatial divisions, concentrating all functions within a single area, reflecting primitive chaos and comprehensive functionality. In contrast, the interior spaces of mature Daur dwellings have undergone significant improvements, exhibiting the following features See Figure 76: Evolution of Daur Residential Architecture CAD).

Clear functional zoning: While retaining some degree of integration, the interior's chaotic layout has been significantly refined, with distinct functional divisions becoming increasingly apparent. For instance, in a two-bay structure, the central bay serves as both an entrance and kitchen space, while the western room combines residential, reception, and ceremonial functions. This design exemplifies the three-sided enclosed, centralized spatial prototype developed from primitive tent architecture.

Distinct Spatial Hierarchy: The Daur ethnic group's dwellings feature a meticulously organized spatial hierarchy. Taking the three-bay structure as an example, the western bay represents the highest status and is typically reserved for elders, while the eastern bay accommodates younger family members or guests. Even within individual rooms, spatial hierarchy persists. Unlike Han Chinese dwellings where the rectangular space enclosed by kang beds primarily serves as a transitional area for daily activities, the southern kang (back bed) houses the eldest family member, the northern kang serves younger generations, and the western kang functions as a reception area with designated niches for ancestral worship.

Detail Design Reflects Spatial Hierarchy: The Daur ethnic dwellings' detailing highlights spatial hierarchy through distinct layouts. The western room, designated as the highest-level space, features standardized three-sided "wanzikang" (arm-shaped kang) structures. The eastern room accommodates flexible configurations,

such as partitioned suites at the front and rear. The western room employs woven willow thatched roofs with wooden flooring, while the eastern room utilizes simple willow straw mats on compacted earthen ground.

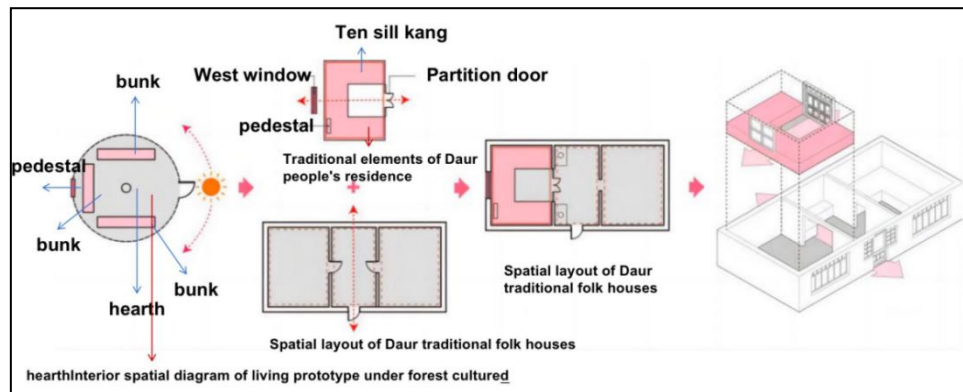


Figure 76 Evolution of spatial characteristics of Daur residential houses CAD

Storage Space: The warehouse building is one of the indispensable facilities in traditional Daur courtyard houses (See Figure 77), primarily used for storing grain and tools. This wooden platform-style structure, known as "Wurugegeri" (round log stacking) or "Taretegeri" (wooden board storage), serves as essential dwellings for nomadic fishing and hunting communities in Northeast China. These elevated granaries store surplus food for future use, with typical examples including the Oroqen's "Aolun," Ewenki's "Kailaobao," and Hezhe's "Fish Basket." Although the Daur people have settled down, they still preserve these storage structures within their courtyards, retaining the architectural features of elevated granaries. This design not only reflects the common characteristics of fishing and hunting communities but also showcases the unique storage methods developed after settling, making it one of the most distinctive types in their traditional architectural system.



Figure 77 Modern restoration of barn and mill house combination form

Distinctive Courtyard Characteristics: Unlike nomadic fishing and hunting tribes, the Daur people developed a unique courtyard culture during the Heilongjiang period due to their stable settled lifestyle. Serving as an extension of indoor living spaces, these courtyards reflect ethnic customs and daily habits through their layout design. As independent units of social production, Daur households utilize courtyards as their smallest communal living units.

The Daur ethnic group's courtyards feature spacious and orderly layouts arranged in a longitudinal rectangular configuration (See Figure 78). Divided by the main house, these courtyards are categorized into three sections: the front courtyard, rear courtyard (known as "yuantian"), and small western garden. The front courtyard typically adopts a Sanheyuan layout, centered around the south-facing main house with east-west wing rooms, granary, mill, livestock pens, and toilets arranged sequentially. This design integrates elements of Han Chinese Beijing Siheyuan architecture while showcasing the Manchu "one main hall with four side rooms" pattern, reflecting cultural integration influenced by Han assimilation after the Daur people migrated south to the Nen River basin during the Qing Dynasty.

The rear courtyard primarily consists of garden fields used for growing corn, vegetables, tobacco leaves, and other crops to meet daily needs, with occasional storage areas. The Small West Garden, located west of the main house, features a nursery and flower beds. Near the westernmost fence stands a small shrine dedicated to deities (See Figure 79).



Figure 78 Floor plan of a Daur residential courtyard

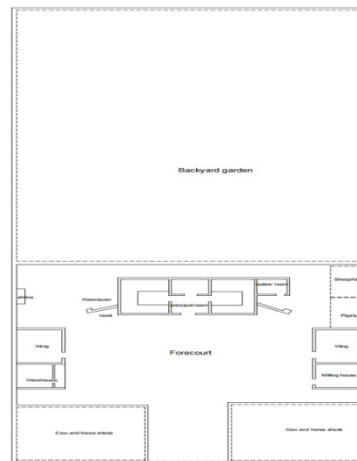


Figure 79 Model of Daur residential courtyard

Traditional Daur House Decoration Features: The craftsmanship in traditional Daur architecture primarily includes wooden frame structures, weaving techniques, and carving artistry. These techniques not only serve practical functions in constructing dwellings and courtyards but also play a decorative role. Carving artistry in Daur traditional dwellings is mainly manifested in lattice screens, wooden crossbeams, window designs, indoor furniture, and kang (a traditional heated floor) railings. Carving methods vary by location, including three-dimensional relief carving, flat ink painting, and openwork perforation carving.

The wooden partition (See Figure 80) serves as a transitional space between the main hall and side rooms, effectively separating living areas from kitchen functions. It comes in two designs: a fully wooden structure featuring carved auspicious patterns on panels, or a partial wooden partition within mud-and-wattle walls adorned with relief carvings. Typically constructed using mortise-and-tenon joints, these partitions include rotating doors at their center for easy passage. In Daur ethnic dwellings, all connections employ traditional mortise-and-tenon joints without nails or ropes. To ensure ventilation, indoor partitions are usually left unroofed, while small round openings are reserved above the eastern gable wall or under eaves. Folklore suggests that missing these openings might cause newborns to develop hearing impairments. This design demonstrates flexible interior zoning, perfectly adapted to the harsh winter climate of northern China.



Figure 80 Traditional wooden door of Daur dwellings

The third kang edge (See Figure 81): In traditional Daur dwellings, the kang serves as a vital living space that accommodates most daily activities. This makes the edge decoration particularly intricate, often featuring relief carvings or ink-painted bas-reliefs. Near the walls, there are decorative strips measuring 12 to 15 centimeters wide, resembling baseboards, carved with simple continuous patterns.



Figure 81 Daur residential kang edge

Production and Living Utensils (See Figure 82): The indoor furnishings prioritize practicality. Along the walls of the kang bed, long cabinets in red or brown hues are arranged, adorned with golden floral-and-bird motifs or intricate relief carvings. These cabinets store daily necessities and ancestral worship statues, while dining tables are placed on the southern or western kang beds, each featuring a heated stone basin beneath. The distinctive baby cradles showcase elaborate relief decorations that add unique charm to the space.



Figure 82 Living utensils in the Exhibition of the Oro Folk Museum

Totem Sculptures: The carving techniques of Daur ethnic dwellings are extensively applied to lattice doors, window grilles, and lintels. The upper sections of door panels typically feature lattice structures adorned with engravings of the Four Treasures of the Study or Eight Immortals' treasures, while the lower flat surfaces often display shallow relief carvings depicting traditional motifs such as seasonal flora, dragon-phoenix auspicious patterns, and other cultural elements. The doors are coated with tung oil for protection (as shown in Figure 83).



Figure 83 Daur decorative totem sculpture daily necessities

(Source: History of the Daur Ethnic Group,2024)

Weaving Techniques: The weaving craftsmanship of Daur dwellings is widely applied in various contexts, demonstrating strong functional value. Firstly, it serves as roof decoration (See Figure 84), with this technique being extensively utilized in Daur residential architecture. It is employed for roof ornaments, kang mats, fence walls, and daily-use items like willow baskets and fishing traps. Primary materials include willow twigs, three-edged grass, and reeds, which undergo sun-drying, soaking, and flattening before being woven according to specific purposes. Fence walls

predominantly use red willow wood, constructed through a three-strand braiding method from bottom to top, while roof decorations employ diverse materials and weaving techniques tailored to specific requirements.



Figure 84 Daur weaving techniques

2.The traditional dwelling of Daur people has the wisdom of keeping warm and cold

(1) rational building layout is crucial for creating a suitable microclimate, which significantly enhances thermal insulation and energy efficiency. Layout selection should consider regional climatic characteristics and adopt corresponding configurations. In Northeast China, Daur dwellings are mainly oriented north–south with entrances facing south to maximize solar gain in winter and reduce the impact of cold winds. Due to the region’s cold continental climate—with prevailing northwesterly winds in winter and southeasterly winds in summer—the orientation and spacing of buildings are carefully designed to ensure adequate sunlight while minimizing heat loss caused by cold air. These variations reflect the adaptation of architecture to local climate and regional features, with orientation, spacing, and overall spatial configuration as key design considerations (See Figure 85.86).

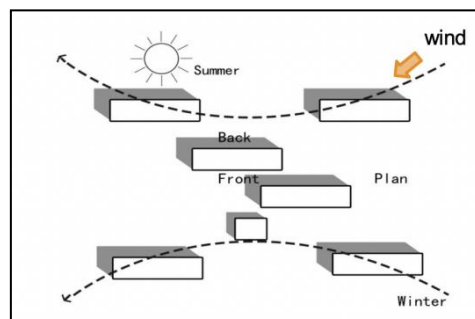


Figure 85 Building Layout Adapted to Sunlight and Wind Direction

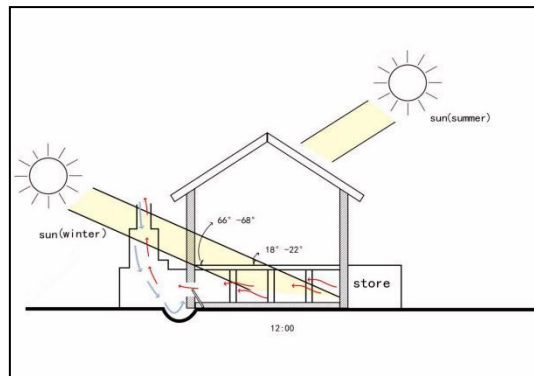


Figure 86 Solar Altitude and Orientation Relationship of Daur Dwellings in Northeast China

(3) Thick Wall Construction. Thermal insulation is crucial in Daur residential architecture. Walls not only define and partition spaces but also serve as key thermal barriers. Due to the cold climate in Daur regions, wall thickness varies by location: northern walls are thickest, followed by southern walls, then gable walls. Interior partitions are typically thin, with poorer housing using straw-mud walls while better-off households opt for wooden panel walls. While rammed earth walls are common, the significant day-night temperature differences in northeastern China cause residual moisture to freeze and expand during winter, leading to cracks. Adding rice straw to clay (See Figure 88) increases wall porosity and elasticity, reducing damage from freeze-thaw cycles.



Figure 87 Exterior wall materials of Daur dwellings

(Source: Daur Ethnic History Series, 2024)

(4) The unique heating method of the horse frame room. The kang is an important part of the building. It is loved for its scientific design, comfortable insulation effect, beauty and durability, and has a high artistic value of architecture. The design of the heated kang emphasizes practicality and ergonomics. Typically matching the room's width, it measures 1.8 to 2.2 meters in length and approximately 0.6 meters in height, positioned slightly above an adult's knee level. The kang's edge is constructed with wooden or bamboo strips, while its three side walls feature smooth wooden panels

adorned with intricate carvings that serve both aesthetic and decorative purposes. Inside, a rectangular heated chamber is built from adobe bricks or brick masonry, where hot air circulates to warm the floor surface. To enhance comfort and insulation, the chamber is lined with bricks, adobe, or stone slabs coated with lime mortar. Reinforced with white lime mortar and reinforced with thick paper, it is finally covered with kang mats (Lu, 1991). This design not only ensures effective heat retention but also provides a comfortable winter living environment (See Figure 89.90).



Figure 88 Daur curved bed

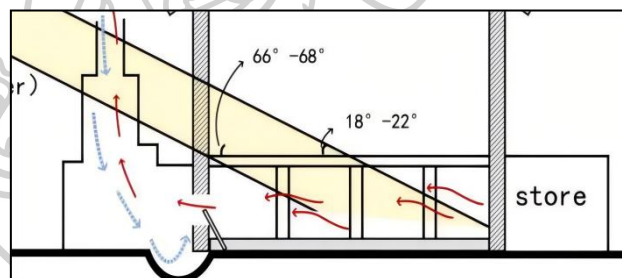


Figure 89 Schematic diagram of heat transfer and ventilation of Daur kang

① Sunlight Exposure Management: Solar radiation plays a vital role in a building's external thermal environment, serving both as an energy source and a key factor influencing physical and mental well-being. However, excessive sunlight can also have adverse effects, making climate-specific site selection crucial. The Daur people place great emphasis on housing location, typically choosing sunny slopes with abundant water resources and lush vegetation. This strategic approach not only helps prevent flooding but also enhances living and working conditions.

Daur dwellings are predominantly south-facing ridge-roofed earthen houses, typically consisting of two or three rooms. Constructed with adobe walls and pine timber beams, these structures feature thatched roofs. Such site selection offers significant solar advantage: buildings on sunny slopes receive approximately 10°C

more sunlight than those on shaded slopes (See Figure 91). In cold winter regions, solar radiation serves as a natural heat source. Therefore, construction sites should be chosen where buildings can fully absorb sunlight while maintaining a low elevation angle. By integrating with the terrain's characteristics, this approach optimizes local climate conditions.

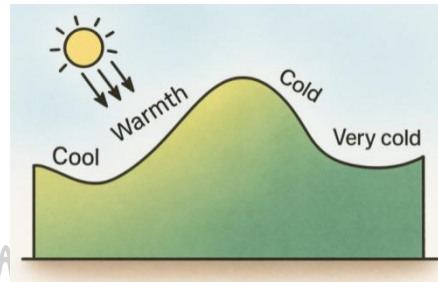


Figure 90 Temperature distribution of Daur residential houses on slopes

② Distinctive Door and Cooking Counter Designs: Unlike the traditional Daur dwellings with numerous windows, these structures feature fewer doors primarily designed to block northern cold winds. The door decorations, however, are meticulously crafted – the main entrance typically features bat carvings symbolizing wealth and happiness, serving as protective charms that ward off evil spirits (See Figure 92).



Figure 91 Daur door decoration modeling

(Source: History of the Daur Ethnic Group, 2024)

Windows serve as essential decorative elements in residential architecture, providing ventilation, natural lighting, and enhancing facade aesthetics. Traditional Daur dwellings are renowned for their multiple window configurations. Main two-bedroom houses typically feature seven windows, while three-bedroom residences may contain 9 to 13 windows. Southern-facing windows are generally larger to maximize sunlight exposure. Influenced by the Khitan people's ancient tradition of westward reverence, western windows offer both excellent summer ventilation and ample winter sunlight. The most common window design is the branch window: upper

sections for ventilation and lower sections for lighting, with frames inside and paper outside. Window lattice patterns often showcase diverse designs, predominantly vertical frames composed of parallel/vertical or horizontal lines (See Figure 93).



Figure 92 Traditional window decoration of Daur dwellings

The pot platform, a vital element of Daur dwellings, embodies their distinctive lifestyle and culinary traditions. Closely integrated with kang (traditional heated floor beds), these platforms typically feature two or more square units measuring approximately 1.2 meters in length and 0.5 meters in width, with heights slightly lower than the kang. This design ingeniously utilizes the kang's residual heat for cooking while optimizing space efficiency, reflecting the Daur people's emphasis on practicality and functionality in traditional architecture (See Figure 94).



Figure 93 Daur residential cooking table

In summary, the Daur people possess millennia of cultural wisdom. Their settlement spaces demonstrate complex and profound cultural dimensions that warrant in-depth research and preservation. In advancing sustainable development and cultural model construction for Daur settlements, the core objective of protecting traditional residential culture lies in achieving harmony between tradition and modernity, rather than rigidly preserving outdated dwellings or clinging to obsolete customs. By integrating ecological conservation with dynamic cultural inheritance, we

can establish a contemporary, sustainable model for Daur settlement spaces. This approach revitalizes traditional residential culture within modern contexts while injecting fresh momentum and inspiration into sustainable development, ultimately realizing the ultimate goal of sustainable evolution for Daur settlement systems.

The selection of research locations constitutes a pivotal element in the entire study design, directly determining both the quality of data acquisition and the practical applicability of conclusions. This study identifies Ermenqin Village in the Meris Daur Autonomous District of Qiqihar City, Heilongjiang Province as its primary research site, complemented by supplementary surveys and comparative analyses of neighboring Daur settlements. Characterized by unique geographical features, distinct climatic patterns, distinctive social structures, and preserved cultural traditions, this region provides an ideal platform for identifying spatial cultural genes and constructing theoretical models of Daur settlement development.

3.2.5.4 Eermenqin location and natural environment

Eermenqin Village is located in the western part of Heilongjiang Province, northeast China, situated in the northeastern area of Qiqihar City's Meilisi Daur Autonomous District, adjacent to the Nen River system. Built along the river on its northeastern side, the village boasts abundant water resources that historically provided sufficient water for both daily life and irrigation, while also forming a production model combining fishing, hunting, and farming. The village's location embodies the traditional wisdom of the Daur people in settlement selection— "living by water and growing near fields" —ensuring diversified development of agriculture, fishing, hunting, and animal husbandry.



Figure 94 Landscape of Ermenqin Village



Figure 95 Google Maps of Ermenqin

The village is situated on a relatively flat terrain within the Nenjiang alluvial plain. The fertile black soil formed through river sedimentation provides ideal conditions for crops like soybeans and corn, which explains the enduring agricultural traditions in the region. Moreover, the surrounding low hills and woodlands not only served as vital hunting grounds and timber sources but also influenced the spatial layout of the settlement to some extent.

3.2.5.5 Climate characteristics and extreme environments

Eerlenqin village is located in the typical cold temperate continental monsoon climate zone, and the climatic conditions have the following significant characteristics:

Extreme temperature variations: Summer temperatures can reach up to 35°C , while winter temperatures often drop below -36°C , with an annual temperature difference approaching 70°C . Such dramatic temperature fluctuations are highly typical in China and even in cold regions worldwide. **Long winters:** Winters last five to six months, with the heating season lasting over 180 days. The prolonged winter forces residents to develop efficient heating systems and insulation measures, which is a key reason for the widespread use of heated brick beds and thick earthen walls. **Strong winds:** Northwestern winds prevail in winter, creating significant wind chill effects that impose additional requirements on building orientation and window placement. Traditional Daur dwellings typically adopt a "south-facing windows, north wall sealed" layout to minimize heat loss. **Uneven precipitation distribution:** Annual rainfall averages approximately 400-500 mm, concentrated in summer. Although winter snowfall is minimal, low temperatures make snow accumulation difficult to melt, often forming long-term coverings on roofs and roads, posing structural challenges requiring load-bearing capacity and snow drainage requirements.

For this reason, Ermencun village can be regarded as a natural experimental field for the adaptability of residential buildings in cold regions. Under

such extreme environmental conditions, the contrast and conflict between traditional architectural wisdom and modern building materials technology provide an ideal sample for this study to observe "cultural-space-performance adaptability".

3.2.5.3 Social structure and demographic characteristics

Ermenqin Village, a hallmark of the Daur ethnic community in Meilisi District, hosts over 60% of its residents as Daur people. The village features both middle-aged and elderly residents preserving traditional lifestyles and younger generations gradually integrating into modern economic systems. This demographic structure not only sustains cultural traditions but also reflects generational differences emerging during the modernization process.

In terms of occupational composition, agriculture remains the main source of livelihood, with approximately 70% of households engaged in corn and soybean cultivation or animal husbandry. Table 7 shows the social structure and demographic characteristics of the Daur ethnic group obtained by the researchers based on the investigation by government departments.

Table 7 Social structure and demographic characteristics of the Daur people .

Category	Group/Attribute	Estimated Number	Source / Notes
Total Population	All permanent residents	825	Provided by village administration
Daur Ethnic Group	Daur villagers	495	60% of the total population
Age Structure	Adults (18+ years)	Approximately 700 (400 Permanent residence)	Confirmed by local government interviews
Age Structure	Children (under 18 years)	Approximately 125 (40-70Permanent residence)	Confirmed by local government interviews
Household Owners	Property owners	185 households	Equal to total household number
Officials	Village/Local government officials	Around 10	Includes cultural and township staff
Outsiders - Researchers & Officers	Research and administrative personnel	10–15 annually	Involved in planning, research, and heritage policy
Outsiders - Tourists	Cultural visitors and tourists	Thousands annually	Observed during tourism season and cultural events

3.2.5.4 Characteristics of the Research Area and Significance of Site Selection

Ermenqin Village has the highest proportion of Daur residents among all villages in Meilisi Daur District, Qiqihar City. As a village listed in the 6th batch of key protected villages, it is in urgent need of formulating quantifiable and implementable protection and development plans. The village has entered a modernization stage, with modern-style buildings as the mainstay. However, it still retains humanistic traces such

as the family-based spatial pattern of "courtyard-road-production area", traditional customs like the Spring Ploughing Festival, and spatial symbols related to ethnic beliefs (e.g., some west-facing windows).

The village has a sufficient number of elderly residents who are bearers of cultural heritage, which facilitates fieldwork and data collation, and lays a foundation for the formulation of subsequent plans.

The village is selected as the research area because it is a typical case of ethnic minority settlements in cold regions, which can provide empirical support for the formulation of plans. In summary, relying on its distinct ethnic demographic characteristics, preserved traditional humanistic traces, convenient research conditions, and the practical needs of being a key protected village, the village has become the core research area of this study, providing a reference for subsequent designs.

3.2.6 Sub-study on social media

In the contemporary digital landscape, cultural dissemination has transcended traditional geographical boundaries and physical limitations, evolving into a multidimensional communication ecosystem centered on social media. As a vital component of China's cultural diversity, ethnic minority cultures require both the preservation of oral traditions and ritual practices within communities, and the enhancement of visibility and public awareness through modern digital platforms. Building on this context, this study introduces a social media sub-research framework. Through systematic data collection and analysis, we investigate the dissemination patterns, audience engagement dynamics, and interactive mechanisms of Daur settlement culture on digital platforms, while further evaluating the synergistic effects between online communication and offline cultural activities.

In recent years, New Media Theory and Cultural Communication Studies have emphasized the crucial role of digital platforms in cultural construction and reproduction. Social media serves not only as a channel for cultural display but also as a space for meaning-making interactions. Through this process, cultural values are not merely disseminated but continuously reinterpreted and reconstructed by the public via likes, comments, and shares. Therefore, incorporating social media data into cultural communication research aligns with contemporary academic trends while providing new perspectives for understanding the dissemination and reception mechanisms of Daur ethnic community culture in modern society.

Methodologically, this study draws on the theoretical frameworks of Digital Anthropology and Audience Studies, emphasizing the complementary nature of online

data analysis and offline fieldwork. Through social media sub-studies, the research establishes dual evidence chains between "field space and digital space," thereby enhancing the comprehensiveness and explanatory power of the investigation.

3.3 Tools and Reliability

In research design, the selection of research tools and the verification of their reliability and validity are crucial for ensuring scientific rigor and credibility of findings. Tools not only serve as instruments for data collection but also act as bridges between theoretical frameworks and practical applications. Inappropriate tool selection or insufficient reliability/validity may directly compromise the validity of research conclusions. Therefore, this study implemented a comprehensive approach during tool development and application, including diversified design approaches, expert reviews, pre-test validation, and systematic analysis of reliability and validity. These measures ensure that collected data authentically and effectively reflect the characteristics of the subjects under investigation.

3.3.1 Instrument System

The research tool system of this study consists of qualitative tools and quantitative tools, supplemented by experimental instruments and data analysis software, forming a multi-level and complementary research framework.

3.3.1.1 Qualitative research tools

Structured Interview Outline: An interview framework was designed based on the research objectives and literature review, covering topics such as settlement spatial organization, cultural practices, lifestyle patterns, inheritance mechanisms, and perceptions of modernization. The semi-structured format ensured both consistency across interviews and flexibility for participants to share their personal experiences and interpretations of Daur cultural life.

Field Observation and Documentation Form: A systematic observation sheet was used to record key information about festivals, community activities, production processes, and daily life scenes in E'ermenqin Village. Each record included the time, location, participants, event description, and researcher's field reflections, providing a foundation for cultural interpretation and spatial analysis.

Document and Archival Analysis: Relevant ethnographic literature, local chronicles, policy documents, and cultural heritage archives were collected and

analyzed to trace the historical evolution and protection status of Daur settlements. This supported the triangulation of data between literature, interviews, and field observations.

Design-based Cultural Research Records: During the design practice phase, researchers kept design logs and visual records, including sketches, photographs, and video clips. These materials documented how cultural elements were interpreted and transformed into models, exhibition layouts, and short video narratives, linking qualitative cultural understanding with practical design expression.

Through the integration of these qualitative tools, the research systematically captured both tangible and intangible aspects of Daur settlement culture and established a foundation for design development and cultural dissemination.

Table 8 Statistical table of expert interviews

Field Investigation: Architectural Mapping and Oral History Interviews (Ermenqin and Hala Xincun Villages)					
Research Village	Name	Gender	Age	Interview Date	Photo
Ermenqin Village, Meilis, Qiqihar	An Zhanzhu	Retired Teacher from Ermenqin Central School	69	2023.7	
Ermenqin Village, Meilis, Qiqihar	Ma Huo Da	Village Head of Ermenqin Village	53	2024.3	
Ermenqin Village, Meilis, Qiqihar	Li Xu	Director of the Office of the Emergency Management Bureau of Meilis, Qiqihar	29	2024.3	
Hala Xincun, Meilis, Qiqihar	Duo Xueying	Village Party Secretary of Hala Xincun, Meilis, Qiqihar	53	2024.4	
Hala Xincun, Meilis, Qiqihar	Zhu Yue Hua	Hani Card Cultural Heritage Inheritor	54	2023.7	
Preliminary tests of the trial construction of sand table models and virtual exhibition halls					

3.3.1.2 Quantitative research tools

Structured Questionnaire: A structured questionnaire using a Likert five-point scale was applied to measure respondents' attitudes toward settlement cultural values, heritage conservation awareness, modernization acceptance, and the effectiveness of online cultural communication.

GIS Mapping Tool: Geographic Information System (GIS) was used to analyze and visualize the spatial patterns of Daur settlements, including the distribution of housing, roads, production zones, and public spaces. This helped reveal the relationship between settlement form and environmental adaptation.

Excel and SPSS Software: Excel was employed for data organization and

visualization, while SPSS supported descriptive statistics, correlation analysis, factor analysis, and reliability/validity testing. These tools enhanced the accuracy and interpretability of the quantitative findings.

Digital and Visual Tools: In addition to numerical analysis, digital visualization tools such as SketchUp, AutoCAD, and animation editing software were used to translate spatial data and survey results into visual models, exhibition layouts, and short video scripts. This integration of visual tools strengthens the connection between data interpretation and cultural expression.

Through the complementarity of qualitative and quantitative tools, this study constructs a systematic data chain across four dimensions: cultural cognition, spatial pattern, public perception, and digital dissemination.

3.3.2 Content validity test of questionnaire tools

Based on the preliminary literature review and in-depth interviews, a questionnaire item pool was initially formed, covering five dimensions of cultural cognition, protection attitude, space utilization, living experience and digital communication, with a total of 30 items.

Expert review and IOC inspection

This study invited three senior experts in the fields of cultural heritage studies, ethnology and sociology (Pan Lei, Guan Xiaoyi, Han Chunyu) to conduct entry reviews. The Item Objective Congruence (IOC) index was used to quantitatively evaluate the relevance and clarity of entries.

The IOC calculation formula is:

$$IOC = \frac{\sum R}{N}$$

Figure 96 Formula for calculating the Index of Item-Objective Congruence (IOC)

(Source: Reproduced from Rovinelli, R. J., & Hambleton, R. K. (1977).)

Among them, ΣR is the sum of the scores given by all experts, and N is the number of experts. The scoring criteria are as follows:

Table 9 Item Objective Consistency (IOC) Evaluation Results

Item	IOC Value	Determination Result	Reason for Determination
Most Items	1.0	Retained	Completely consistent with the research objective.
Q5	0.6	Retained after Modification	In the range of 0.50 – 0.69, so retained after modification.
Q7	0.3	Excluded	Lower than the 0.50 threshold.
Other Items (≥ 0.70)	≥ 0.70	Retained	Meet or exceed the IOC ≥ 0.70 retention criterion.

The final results were: 28 items were directly retained, 1 item was retained after modification, and 1 item was eliminated. The overall average value of IOC was 0.95, indicating that the questionnaire items were highly consistent with the research objectives and had good content validity.

3.4 Analytical techniques and models

3.4.1 Quantitative Analysis

The quantitative part of this study mainly aims to summarize and understand general patterns from the questionnaire data. Basic statistical methods were used to describe participants' background information and their overall attitudes toward Daur settlement culture, modernization, and online communication.

Excel and SPSS software were applied to calculate frequencies and averages and to make simple charts that help visualize public opinions and tendencies.

Instead of complex statistical modeling, the focus was placed on interpreting the meaning behind the numbers—for example, identifying which aspects of Daur culture are most recognized by the public and which forms of digital presentation are most accepted. These results provide supportive evidence for qualitative findings and help explain how people perceive, accept, and interact with Daur culture in contemporary contexts.

3.4.2 Qualitative Analysis

In the qualitative part, this study focuses on understanding the cultural meaning and spatial logic of Daur settlements through interviews, field observations, and online communication materials.

3.4.2.1 Thematic Analysis

Interview transcripts and field notes were reviewed and organized according to recurring themes. Four major themes were identified: spatial wisdom, cultural identity, daily life practices, and modern adaptation. These themes summarize how traditional settlement culture reflects the interaction between people, space, and environment, and how it continues to evolve in modern contexts.

3.4.2.2 Online Content and Emotional Analysis

Comments and feedback collected from Douyin and other social media platforms were analyzed to understand how audiences perceive and respond to Daur culture.

The analysis focused on identifying frequently mentioned topics, emotional tendencies (such as appreciation, curiosity, or nostalgia), and public attitudes toward cultural heritage and digital exhibitions. These findings help explain how digital media contributes to cultural recognition and dissemination.

3.4.3 SWOT and TOWS Strategy Generation

In order to translate the research findings into operational cultural protection and development strategies, this study conducts three-stage deduction based on SWOT and TOWS methods:

Phase 1: Diagnosis

Based on field research and statistical analysis, we identified the strengths (S), weaknesses (W), opportunities (O), and threats (T) in the development of Daur settlements. Strengths: Abundant ice-snow tourism resources and distinctive ethnic cultural features; Weaknesses: Harsh climate conditions posing challenges to agriculture and daily life; Opportunities: Government support policies for ethnic minority cultures and rural tourism; Threats: Climate risks and challenges from economic structure homogenization.

Phase 2: Weighting

The Delphi method was used (inviting experts to repeatedly assess the importance of SWOT elements; using the Analytic Hierarchy Process (AHP) to determine weights and test consistency (CR < 0.1 is acceptable).

The third stage: strategy formulation

According to the TOWS matrix, the SWOT elements are grouped into four types of strategies: SO strategy (taking advantage of strengths to seize opportunities);

ST strategy (using strengths to deal with threats); WO strategy (making up for weaknesses to seize opportunities); WT strategy (reducing weaknesses to avoid threats).

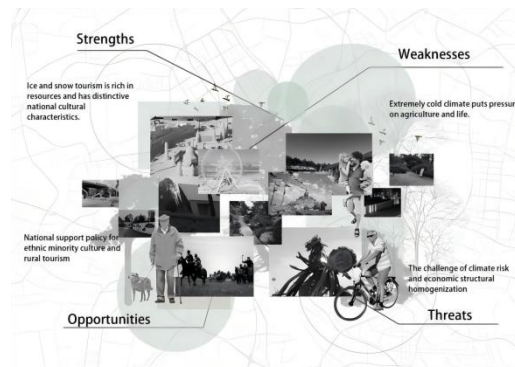


Figure 97 SWOT analysis diagram

The TOWS matrix analysis developed based on the regional context of Daur settlements serves as a strategic framework guiding the experimental process for sustainable development

Inside / Outside	Opportunities (O) 机会	Threats (T)
优势 (S)	S: Internal advantage: Winter tourism advantage (snow and ice sculpture)	T: Cold conditions (-40 °C)
	S+O: Use the advantages of winter tourism to attract more tourists to know the Daur culture	S+T: Use the low temperature to develop ice sculpture tourism projects and their supporting thermal facilities to reduce the threat caused by cold
劣势 (W)	W: Minus 40 degrees in winter. The impact of extreme cold, low crop yields, economic backwardness	W: Extreme weather affects economic development
	W+O: The use of cold weather to promote tourism, promote the economic development of local residents, while spreading minority culture	W+T: Strengthen winter snow and ice tourism publicity, attract more tourists, improve economic benefits, bring cultural communication

Figure 98 TOWS analysis diagram

The strategy was assigned to three types of core stakeholders, namely community residents, government departments and scholars, and evaluated from two dimensions of "feasibility and influence" by Likert scale;

Finally, the priority of strategy is formed and the implementation roadmap is drawn to provide decision-making basis for cultural protection and regional development.

Pilot Test: A pilot study was conducted with approximately 134 randomly selected participants from Qiqihar City and Ermenqin Village. The questionnaire's semantic clarity and scale operability were validated through data distribution analysis and participant feedback. Pilot results demonstrated a well-structured item distribution, a Likert scale with high discrimination, and revisions made to ambiguous statements prior to formal administration.

This study combines quantitative analysis, qualitative research, and SWOT and TOWS strategic modeling to reveal the inherent logic and spatial wisdom of Daur settlement culture, while providing empirical support and actionable pathways for future conservation and development. Quantitative data ensures scientific rigor in

conclusions, qualitative materials enrich cultural interpretation, and SWOT and TOWS methodology facilitates practical application of research findings.

3.5 Field Study

The field study serves as the empirical foundation of this research, providing first-hand data for understanding the spatial organization, architectural features, and cultural life of Daur settlements. Through systematic fieldwork—including site mapping, household interviews, photographic documentation, and participatory observation—this study constructs a comprehensive portrait of both the physical and social dimensions of settlement space.

The collected data focus on the distribution of residential, productive, and ritual areas; the use of local building materials; and the behavioral patterns embedded in daily life. These findings reveal how traditional spatial wisdom reflects ecological adaptation and social organization within the community.

By integrating spatial analysis with cultural interpretation, the field study not only records the tangible and intangible heritage of Daur settlements but also provides a foundational reference for the subsequent design framework and sustainable development model proposed in this research.

3.5.1 Settlement mapping and living practices

In the field research stage, this study took Ermenqin Village as the core field and conducted field mapping and life practice survey on 86 households, and obtained the following main findings:

3.5.1.1 Orientation of the building

The survey reveals that approximately 78% of residential buildings face south, with 12% oriented southeast and the remaining 10% distributed in other directions. South-facing layouts not only enhance winter lighting and heat retention but also embody traditional wisdom in cold-region settlement design. Southeast-oriented structures, predominantly built in the past two decades using brick-concrete or painted steel frameworks, demonstrate the divergence between architectural style and practical functionality in modern construction practices.



Figure 99 South-facing houses: approximately 78%



Figure 100 South-facing houses: approximately 78%



Figure 101 Houses facing southeast: approximately 12%



Figure 102 Wooden beams + iron sheets: approximately 18%

3.5.1.2 Roof and wall materials

Brick-mix and tile structures: Accounting for approximately 71%, representing the predominant residential form in villages that blend traditional and modern features. Wooden beams with painted steel structures: Comprising about 18%, primarily from government-funded renovation projects or villager-built improvements in recent years. While easy to construct, these structures lack adequate insulation. Traditional wooden beams with straw shingles: Making up around 11%, commonly found in older homes preserved by elderly residents. Their thick walls provide superior thermal insulation compared to lightweight materials.



Figure 103 Other orientations (east, north) : approximately 10%



Figure 104 Wooden beams + straw MATS (traditional): approximately 11%

3.5.1.3 Agriculture and production activities

Crop cultivation: Approximately 76% of households still primarily grow corn and soybeans, reflecting the village's adherence to a traditional Northeast China agricultural pattern. Livestock farming: About 15% of families raise cattle and sheep to supplement household income and meet daily consumption needs. Craft preservation: Around 4% of households retain weaving and woodworking skills, which help sustain the Daur ethnic group's cultural heritage through these traditional crafts.



Figure 105 Cattle raising in Ermenqin Village



Figure 106 Corn and soybean cultivation fields in Ermenqin Village

3.5.1.4 Daily heating

The kang (traditional heated brick stove) remains the primary heating solution, with a utilization rate of 82%. Approximately 74% of kitchens are connected to these heated stoves, reflecting the traditional practice of "heating through cooking" that integrates heating and culinary functions. During winter, indoor temperatures typically range between 18-22°C even when outdoor temperatures drop to -20°C, demonstrating excellent thermal comfort. These data indicate that the Daur ethnic group's traditional dwelling patterns coexist with modern architectural methods in villages, forming a multi-layered framework of "cultural preservation, modern adaptation, and functional integration".

3.6 Interviews

As a vital tool in qualitative research, interviews can deeply reveal cultural details and social mechanisms that digital methods and questionnaires cannot capture. In this study, the purpose of interviews is to extract core elements of Daur settlement culture from the experiences, perceptions, and value judgments of different groups, while understanding their changes and responses during modernization. To achieve this, the research adopted semi-structured interviews to ensure both systematic rigor and flexibility in the conversation.

3.6.1 Participants and Topics

3.6.1.1 Interviewee selection

In order to obtain comprehensive and multi-dimensional data, this study interviewed representatives from four key groups during the fieldwork:

1. Retired teachers

Background: They have been teaching in the village or surrounding areas for a long time, and have a deep understanding of local history and cultural inheritance; Significance: They can provide cultural cognition from an educational perspective, and witness the changes of village space and lifestyle over decades.

2. Village cadres

Background: Responsible for village management, public affairs and policy implementation; Significance: Can explain the way of village governance and cultural activities organization, and provide first-hand information about the impact of policies and infrastructure construction on settlements.

3. Head of emergency management department

Background: Responsible for extreme weather, disaster management and related public safety affairs; Significance: How building safety, heating methods and settlement layout relate to risk management in extremely cold environments is an important perspective to understand spatial adaptability.

4. Cultural heritage bearers

Background: Including traditional craftsmen, festival hosts, folk song and dance performers; Significance: They are the core carriers of intangible cultural heritage, and can provide in-depth narratives about skills, rituals, symbolic meanings and cultural values.

3.6.1.2 Interview themes

The interviews focus on the following key themes related to Daur settlement culture and contemporary transformation:

Settlement Evolution: Exploring how the spatial layout and community structure of E'ermenqin Village have changed over time, and how these transformations reflect social and economic development.

Cultural Practices and Rituals: Understanding the organization and meaning of traditional festivals, daily customs, and symbolic activities that strengthen

community cohesion and cultural identity.

Architectural Features and Building Materials: Discussing the characteristics of traditional Daur houses, including local materials and construction techniques, and examining how these have been adapted or replaced in modern times.

Modernization and Spatial Change: Analyzing how modernization, new infrastructure, and contemporary housing have influenced the traditional settlement space and residents' lifestyles.

Cultural Education and Tourism Connection: Investigating how local cultural resources are shared, taught, and transformed into tourism experiences or economic opportunities through exhibitions and educational programs.

Digital Communication and Cultural Dissemination: Exploring participants' attitudes toward digital exhibitions, short videos, and social media platforms as new channels for promoting and preserving Daur culture.

These interview themes directly support the research objectives and complement the findings from the questionnaire survey and field observations, forming a comprehensive understanding of cultural continuity and transformation within the settlement.



Figure 107 Interview process record

3.6.2 Process and Quality Control

3.6.2.1 Interview process

1. Preparation phase

Develop a semi-structured outline to ensure that the questions cover the core themes of the study while allowing flexible follow-up questions based on respondents' responses.

The interview outline was pre-tested and the clarity of the questions was adjusted according to the feedback.

2. Implementation phase

Interviews are typically conducted in familiar settings for respondents (such as homes, village committees, or activity venues) to reduce psychological stress. Each session lasts approximately 45-90 minutes, though interviews with cultural heritage bearers may extend beyond two hours due to skill demonstration components. The entire process is recorded using audio equipment, while research assistants take brief notes to document non-verbal cues including facial expressions, body movements, and emotional fluctuations.

3. Data collation

The recording and transcription shall be completed within 24 hours after the interview; the transcribed manuscript shall be anonymized, and sensitive personal information such as name and specific address shall be removed to protect privacy.

3.6.3 Academic value

Through the design and implementation of this interview study, our research not only gathered firsthand accounts on settlement evolution, cultural practices, and spatial wisdom, but also demonstrated significant value in the following aspects: 1) Enhancing cultural understanding: Providing supplementary explanations for sociocultural mechanisms beyond quantitative data; 2) Revealing intergenerational differences: Comparing narratives between younger generations and older populations to identify continuity and discontinuity in cultural transmission; 3) Bridging practice and theory: The interview materials offer qualitative evidence for SWOT/TOWS analysis and provide semantic support for constructing a cultural sustainability model; 4) Enriching case studies: Oral histories and experiential narratives form long-term cultural archives, providing valuable resources for subsequent research and policy development.

Interview research served as the "cultural decoder" in this study. Through in-depth dialogues with retired teachers, village cadres, emergency management personnel, and cultural heritage bearers, we systematically collected and analyzed core issues regarding the spatial evolution, cultural practices, and modernization transformation of Daur settlements. Rigorous quality control measures—including member verification, dual coding, consistency checks, and triangulation—ensured the credibility of interview data, thereby establishing a solid

empirical foundation for the cultural model proposed in this research.

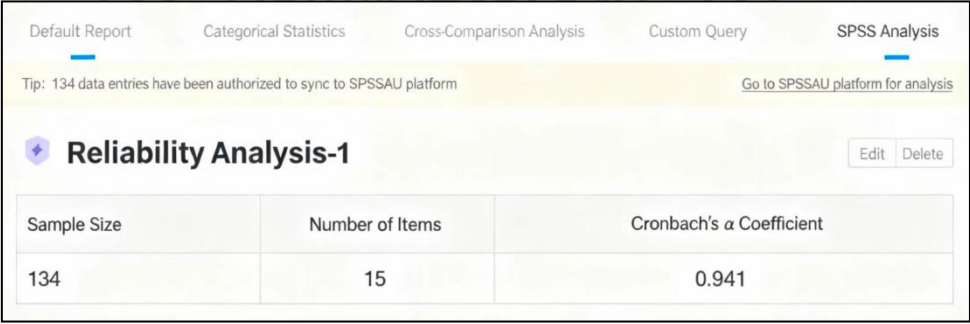
3.7 Questionnaire survey

3.7.1 Research background and core objectives

To systematically explore the cognitive level, protection attitude, spatial memory characteristics and experience perception of different stakeholder groups towards the Daur settlement culture, and to verify the scientificity and effectiveness of the research tools, To provide empirical support for the subsequent three core research goals of "Cultural Gene Identification and Database Construction", "Analysis of Cultural Functions and Sustainable Development Implications", and "Design of Sustainable Development Model for Ermenqin", this study conducted a special questionnaire survey. The research strictly followed the combined method of "stratified purposeful sampling + quota sampling + special sampling", and the sample selection was highly compatible with the research objectives.

3.7.2 Sample population characteristics

A total of 150 questionnaires were distributed in this survey, and 134 valid questionnaires were retrieved (with an effective recovery rate of 89.33%). The sample size (N=134) met the statistical significance requirements of social science research, and the sample grouping, quantity and proportion were completely consistent with the design of the research objective



The screenshot shows the SPSS Analysis interface with a navigation bar at the top containing 'Default Report', 'Categorical Statistics', 'Cross-Comparison Analysis', 'Custom Query', and 'SPSS Analysis'. A tip message states: 'Tip: 134 data entries have been authorized to sync to SPSSAU platform' with a link 'Go to SPSSAU platform for analysis'. The main section is titled 'Reliability Analysis-1' with 'Edit' and 'Delete' buttons. Below this is a table with the following data:

Sample Size	Number of Items	Cronbach's α Coefficient
134	15	0.941

Figure 108 Reliability Analysis Result

3.7.2.1 Questionnaire Analysis Report

1. Research Background and Purpose

This questionnaire aims to explore the current situation of cultural cognition, protection attitude, spatial memory and experience of Daur settlement culture, verify the reliability and validity of the questionnaire tool through empirical data, and provide a basis for the follow-up research on cultural inheritance and

protection.

2. Sample characteristic analysis

Total samples: 134 valid questionnaires. Gender distribution: 93 males (69.4%) and 41 females (30.6%). age structure : 18-25 years: 72 persons (53.73%). 26-40 years: 36 (26.87%). 41-60 years: 20 persons (14.93%). 61 years and above: 6 persons (4.48%). Category of identity: 53 students (39.55%), 41 local residents (30.6%), 26 tourists (19.4%) and 14 others (10.45%). Visits: 73 people (54.48%) visited the Daur settlement, 61 people (45.52%) did not visit

The sample group is mainly young students and local residents, which ensures the representativeness and diversity of the questionnaire.

3. Reliability analysis results

To ensure the internal consistency and stability of research tools, SPSS 26.0 was used to conduct reliability analysis on 15 core measurement items. The results are shown in the following table 8:

Table 10 Reliability Analysis Results of Core Measurement Items

Test Indicator	Specific Value	Evaluation Standard	Result Judgment
Number of Measurement Items	15	-	-
Sample Size	134	-	-
Cronbach's α Coefficient	0.941	$\alpha \geq 0.9$ indicates extremely high reliability; $\alpha \geq 0.7$ indicates acceptable reliability	Reaching the level of extremely high reliability, the item design is scientific and logically consistent, and the measurement results are reliable

4. Analysis of Core Research Results (Corresponding to Research Objectives)

Based on the scoring rules of the Likert 5-point scale (1 = strongly disagree, 5 = strongly agree), descriptive statistics were conducted on the three dimensions of cultural cognition, spatial memory, and protective attitude. The scores of each dimension and group differences are shown in the following table 10.

Table 11 Descriptive Statistics and Group Differences of Three Dimensions: Cultural Cognition, Spatial Memory, and Protective Attitude

Research Dimension	Overall Mean (M)	Standard Deviation (SD)	Core Score Performance of Each Group	Adapted Research Objective
Cultural Cognition	3.79	0.52	- Local Villagers: Correlation between house orientation and climate adaptability (4.12), U-shaped kang (4.05)	Cultural Gene Identification and Database Construction
			- Student Group: Recognition of cultural elements (3.68)	
			- Expert Group: Verification of the rationality of cultural gene definition (4.10)	
Spatial Memory	3.91	0.48	- Tourist Group: Memory of integration between festival rituals and space (4.01)	Analysis of Cultural Functions and Implications for Sustainable Development
			- Local Villagers: Perception of courtyard structure and community cohesion (4.08)	
			- Overall: Concern about memory loss due to lack of protection (4.03)	
Protection Attitude	4.06	0.45	- Government/Community Workers: Policy-adaptive protection (4.15)	Design of Ermenqin Sustainable Development Model
			- Student Group: Digital protection and younger-oriented communication (4.18)	
			- Tourist Group: Cultural tourism integrated protection (4.09)	
			- Expert Group: Scientificity of integration between tradition and modernity (4.20)	

1. Conclusions and Academic Implications

Tool Reliability: The questionnaire's Cronbach's $\alpha = 0.941$, indicating extremely high internal consistency, providing a solid tool foundation for the empirical analysis of the three research objectives;

Sample Adaptability: The sample grouping, quantity, and proportion are completely consistent with the research objective design, covering core, key, and guarantee groups, ensuring targeted support of data for each objective;

Research Support Value: The research results clearly show the cognitive, memory, and attitude characteristics of different groups. First-hand information from local villagers supports cultural gene identification, feedback from tourists supports the analysis of cultural functions and market demand, perspectives from students support model innovation, and opinions from experts and government/community workers ensure the scientificity and implementability of the model, providing comprehensive empirical basis for the realization of subsequent research objectives.

In summary, through scientific sampling design, strict reliability testing, and a sample structure highly compatible with research objectives, this questionnaire survey systematically obtained 134 valid data. The data is both representative and reliable, laying a solid empirical foundation for the subsequent construction of cultural gene database, analysis of sustainable development implications, and design of Ermenqin sustainable development model.

3.8 Participatory observation

Participatory observation stands as a cornerstone methodology in anthropological and ethnographic research, enabling scholars to navigate study sites through dual roles as both participant and observer. This approach allows researchers to directly engage with cultural practices within authentic social contexts, documenting and reflecting on them firsthand. By implementing participatory observation, this study seeks to address the limitations of traditional questionnaires and interviews in capturing dynamic interactions and implicit cultural elements. Through immersive fieldwork participation, it aims to reveal the intrinsic logic governing spatial organization and cultural life in Daur communities.

3.8.1 Observation Settings

In order to cover the multi-level manifestations of Daur settlement culture, this study designed and implemented several participatory observations in typical scenarios during fieldwork:

3.8.1.1 Village celebrations such as spring ploughing festival

As a vital agricultural ritual, the Spring Plowing Festival embodies strong community cohesion and cultural symbolism. Researchers participated throughout the ceremony, documenting villagers' cultural logic in spatial arrangements, sacrificial offerings, and directional choices. By observing the festival's organizational processes and crowd interactions, we can reveal how these celebrations continue to serve as social integrators and cultural bearers in modern society.

During the event, men, women, and children all take part in specific roles: elders lead the prayers and rituals, middle-aged men perform the symbolic first plough, and women and children join in collective singing and dancing. The researchers documented how the entire community becomes a dynamic organism of interaction—villagers exchange blessings, share food, and express their hopes for prosperity and stability. The organization of the event demonstrates a well-structured division of space and labor, revealing the embedded social order within the community.

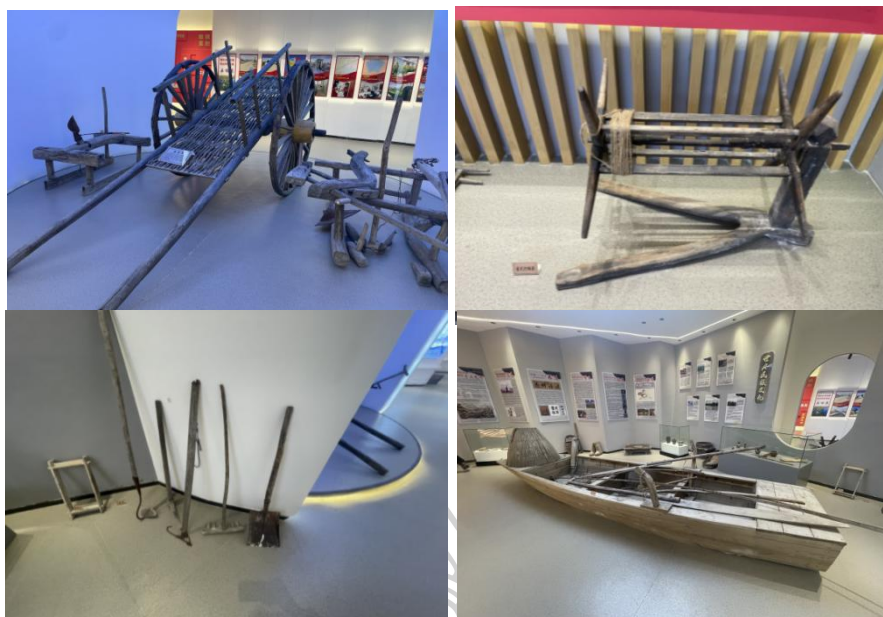


Figure 109 Spring ploughing observation record

3.8.1.2 Dance and folk performance

Dance and folk performance represent one of the most vivid and dynamic aspects of the Daur community's cultural life. These performances are not merely artistic expressions but also act as important vehicles for transmitting collective memory, reinforcing community bonds, and shaping cultural identity. During major festivals such as the Spring Festival, Nadam Fair, and harvest celebrations, villagers gather in open spaces or village squares to perform collective dances characterized by circular formations, rhythmic drumbeats, and symbolic gestures derived from hunting, farming, and daily life scenes.

In addition to these traditional dances, villagers—especially the elderly—often sing folk songs that narrate historical events, express emotions of love and longing, or celebrate the harmony between humans and nature. These spontaneous performances are usually accompanied by traditional instruments such as the morin khuur (horsehead fiddle) and mouth harp, creating a unique soundscape that blends melody with storytelling.



Figure 110 Festival observation records

3.8.1.3 Hunting and farming experiences

The researchers actively participated in fishing, hunting, and various types of fieldwork together with local villagers in order to gain a deeper understanding of traditional labor methods and the use of indigenous tools. Through these immersive activities, they were able to document the entire process of production—from the preparation and selection of tools to the actual performance of collective tasks. The researchers carefully observed how different forms of production influenced the spatial organization of the settlement. For example, the locations of fishing gear and hunting tools often reflected the proximity to rivers or forested areas, while the layout of grain storage facilities, livestock pens, and working sheds was closely related to seasonal activities and family structures. These observations revealed that the spatial distribution of production-related elements was not random, but rather represented an adaptive system developed through generations of experience, reflecting both ecological wisdom and social organization within the Daur community.



Figure 111 Observation record of fishing tools

3.8.1.4 Home interior space use

Enter multi-household residences to observe the practical use of indoor spaces, including the distribution and interaction between functional areas such as heated brick beds, kitchens, storage rooms, and living rooms. Special attention should be paid to the multiple roles of heated brick bed systems in heating, cooking, and social interactions, as well as gender and intergenerational division of labor among family members in spatial usage.



Figure 112 Observation records of current dwellings in Eermenqin Village

3.8.1.5 Traditional Process Demonstration

Participants engage in and document craft activities such as weaving, woodworking, and embroidery, observing the technical processes, tool usage, and symbolic decorative elements. Through hands-on learning, they gain deeper understanding of how craftsmanship interacts with cultural heritage. By covering public events, daily life practices, and household activities, these observation scenarios provide a multidimensional understanding of cultural spaces for this study.



Figure 113 Observation records of handicraft inheritors

3.8.2 Recording Protocol and Reflexivity

3.8.2.1 Recording specifications

In order to ensure the system and traceability of observation data, this study adopts the following recording method: event log (Event Log)

The time, place, participants, activity content and the researcher's immediate impression were recorded for each observation. The double-column

structure of "fact description and preliminary interpretation" was adopted: the left column was objective record, and the right column was the researcher's immediate explanation and questions, which was convenient for later analysis.

1. Three-dimensional recording template (Time-Space-Actor)

(1) Time dimension: record the start and end time of events and stage changes, such as ritual preparation, process and end;

(2) Spatial dimension: mark the specific location where the activity takes place (square, farmland, indoor, etc.), draw a brief sketch or attach GIS points;

(3) Character dimension: describe in detail the identity, gender, age, role division of participants, as well as their position and behavior in the interaction.

2. Audiovisual materials

With consent, photos and short videos are taken with a camera or mobile phone to make up for the lack of written records; each image is accompanied by time and scene description to correspond with the log.

At the end of each day, write a personal field diary based on the survey content of the day, summarizing the observations, personal feelings and unanswered questions of the day. The diary contains both objective phenomena and subjective feelings, providing a basis for subsequent reflection and analysis.

3.9 Summary of research methods

3.9.1 Data

Five types of data sets were formed: field text and image, GIS and architectural mapping, questionnaire and statistical table, experimental curve and parameter, social media communication log.

3.9.2 Tools

Unstructured interview outline, observation form and log, structured questionnaire, GIS/map drawing, Excel/SPSS statistics, temperature control and temperature measurement system, physical sand table and digital cloud exhibition hall prototype.

3.9.3 Design process

3.9.3.1 Building the theoretical framework

This study's theoretical framework centers on settlement spaces and vernacular wisdom, grounded in the policy context of rural revitalization and intangible

cultural heritage preservation. It emphasizes sustainable development and cultural continuity in Daur settlements through fieldwork, oral history documentation, and physical reconstruction modeling. By applying Grounded Theory (GT) to analyze cultural units, we identify core elements of settlement architecture and residential wisdom. Through documentation, visualization, and digital dissemination, the research aims to protect and showcase endangered spatial configurations, ultimately establishing a cultural preservation model for sustainable development.

3.9.3.2 Design method

The design method of this study is based on the 3R path (Recognize–Reproduce–Revitalize), and combined with the theories of sustainable development, narratology, participatory design and digital cultural heritage communication, to construct a model for the protection and inheritance of Daur settlement space.

First of all, in the recognition stage, through field investigation, historical documents and database establishment, the spatial pattern of settlements and residential wisdom are analyzed, and cultural genes and traditional values are identified, focusing on the loss of culture, decline of handicrafts and intergenerational fracture.

Secondly, in the reproduction stage, the ecological wisdom of Daur dwellings is verified through the comparison experiment of thermal insulation performance between traditional and modern dwellings. Meanwhile, the physical model of settlement space is constructed to reveal the functional connection between living, production and belief, and educational communication is realized through physical and cognitive tools.

Finally, during the revitalization phase, we will design digital exhibition halls with QR code interactive experiences to achieve visualized and immersive cultural dissemination. Simultaneously, we will explore economic linkage mechanisms between exhibition halls and rural tourism, driving revenue growth for homestays, handicrafts, and cultural creative products. This approach ultimately achieves the integration of cultural identity and rural revitalization.

Through the above methods, this study organically combines experimental verification, spatial modeling, digital communication and economic linkage, and puts forward a practical path for sustainable development and cultural protection of Daur settlement space.

3.9.3.3 Design Framework

The preservation and development of Daur settlement spaces also face the "3C" dilemma: Culture Deserted —— Settlements are gradually being abandoned; Craft Degeneration —— Architectural and craft wisdom are gradually disappearing; Connection Disconnect —— Cultural inheritance chains are weakened.

To address these issues, this study proposes a “CRD” theoretical design framework through field investigation, historical document review and database establishment. The framework is centered on three levels:

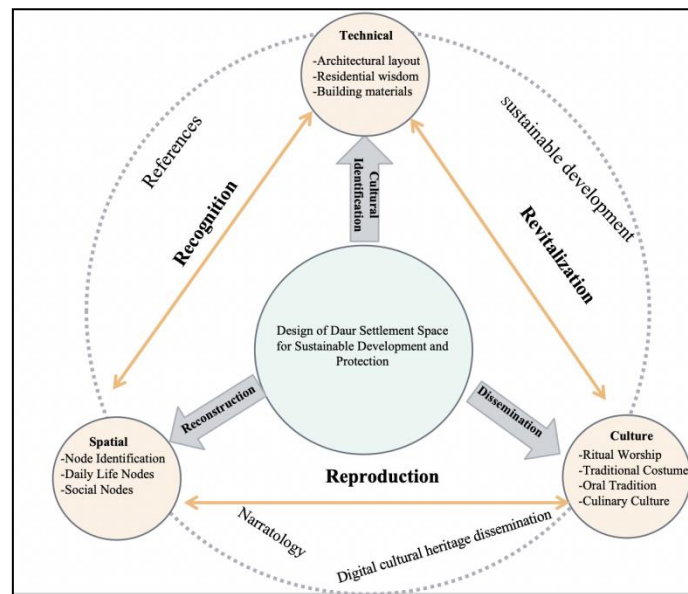


Figure 114 "CRD" Design Theory Model

C (Cultural Identification – technical layer): This layer focuses on identifying and verifying the cultural wisdom embedded in Daur dwellings through technical analysis. The research examines the construction logic, thermal performance, and ecological adaptability of traditional architecture to reveal how technical elements reflect cultural values and collective identity.

R (Reproduction--spatial layer reproduction): Through the identification of spatial nodes and model construction, the settlement structure logic of "residence, production and belief" is reproduced.

D (Dissemination--Cultural Level Dissemination and Revitalization): Promoting cultural communication, community development and rural revitalization by using digital exhibition halls, interactive design and cultural tourism linkage.

Under this theoretical framework, the research further forms the “3R ” design path:

Recognition (identification): distinguish the core elements of settlement space and residential wisdom;

Reproduction: the reproduction of traditional settlement patterns through physical modeling and digitization;

Revitalization: to combine the settlement space with the needs of modern society to achieve the dual goals of cultural inheritance and economic development.

Finally, this framework not only provides theoretical support for the sustainable development of Daur settlements, but also explores a replicable model for the protection and reuse of ethnic settlements in cold areas.

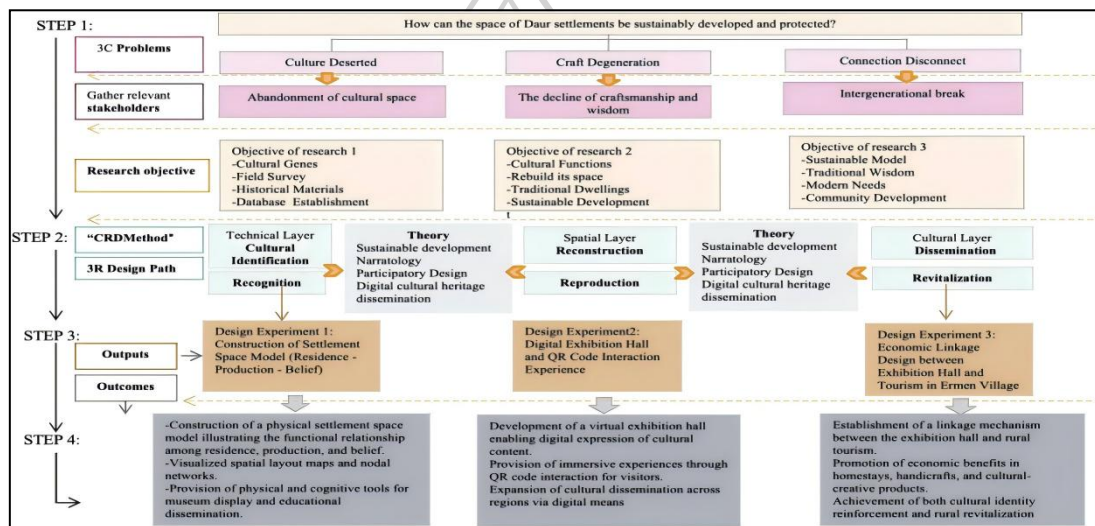


Figure 115 Design Framework

CHAPTER 4

DESIGN EXPERIMENT

Based on the major issues identified in Chapter 1—including the risk of cultural discontinuity due to the Daur people’s oral transmission-dependent culture, the disappearance of settlement spaces due to intermarriage and natural disasters, and the exacerbation of cultural endangerment by remote environments and economic backwardness—combined with the theoretical support from the literature review in Chapter 2 and the empirical findings from research methods such as fieldwork and questionnaire surveys in Chapter 3, this chapter presents three research results (design experiments).

These experiments are developed based on the Daur Settlement Cultural Model (Figure 116 as illustrated in the framework, which systematically integrates tangible culture like architectural form, settlement layout, and ritual sites, and intangible culture such as shamanic rituals, festivals, and social customs across 7 core scenes). The core logic for selecting these three research results is as follows: They are systematic summaries and practical transformations based on the research methodology system in Chapter 3 (fieldwork, questionnaire analysis, grounded theory, etc.), addressing the practical pain points of Daur cultural inheritance from three dimensions, all rooted in the cultural model’s structure:

Design Experiment 1: “Village Model” corresponds to Research Objective 1 (Cultural Gene Identification and Database Construction). Through the physical sand-table model and spatial node mapping of Ermenqin Village, the relationships among dwelling, production, and belief spaces are visualized, reflecting the spatial order and daily logic of the settlement. Grounded theory analysis helps identify key cultural clues embedded in residents’ narratives and spatial practices, providing an intuitive carrier for the study and validation of cultural genes in Daur settlement spaces, and laying the material foundation for the spatial dimension of the cultural heritage database.

Design Experiment 2: “Digital Museum Contents” corresponds to Research Objective 2 (Cultural Function Analysis and Sustainable Development Reference). By digitizing and archiving the collected texts, images, and oral materials from fieldwork, the cultural information that once relied on oral transmission and was at risk of disappearing is systematically preserved and represented. The online display increases cultural visibility and helps these materials reach a wider audience. While clarifying cultural functions, it provides theoretical and practical references for sustainable

development and ensures the continuation of endangered traditions to promote cultural sustainability.

Design Experiment 3: “Video Clip on Douyin” corresponds to Research Objective 3 (Sustainable Model Design). Using short videos as a medium, Daur culture is communicated through images and storytelling, attracting public attention and tourist interest, helping more people learn about the community’ s lifestyle and traditions, and contributing modestly to local tourism promotion. This output is a practice of the sustainable model that integrates Daur traditional wisdom with modern needs, playing a role in promoting cultural transmission, community cohesion, and local development, and reflecting the practical value and social significance of research results in daily communication.

Together, these three design outputs vividly demonstrate how Daur traditional wisdom persists and innovatively spreads in contemporary society. Grounded in rigorous, authentic fieldwork, this chapter not only aims to enhance public awareness of the Daur people’ s unique spatial culture and time-honored living wisdom—thereby contributing to systematic cultural documentation and intergenerational transmission—but also conducts a comprehensive, multi-stakeholder evaluation of the designs’ effectiveness. By collecting and analyzing feedback from residents, tourists, academic scholars, and government agencies, it further verifies the feasibility and practical value of the research objectives, ensuring the solutions are both theoretically sound and practically viable.

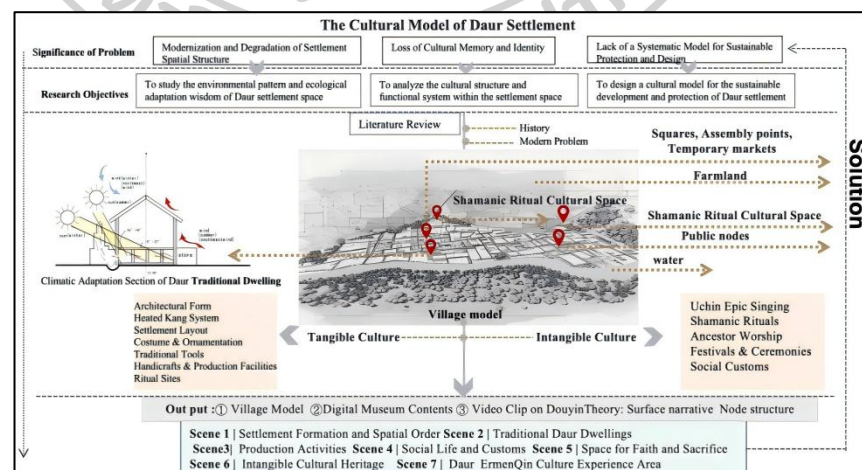


Figure 116 The Cultural Model of Daur Settlement

4.1 Design proces

This study focuses on identifying, verifying, and preserving the traditional settlement spaces and cultural wisdom of the Daur ethnic group, aiming to explore an effective approach for cultural inheritance and sustainable protection in cold regions.

The research process integrates field investigation, experimental analysis, and digital documentation to establish a systematic path from cultural identification to preservation and dissemination. The design thinking emphasizes the relationship between space, culture, and daily life, balancing the traditional settlement's functional logic, ecological adaptability, and social meaning.

Using Grounded Theory as the analytical method, E'ermenqin Village is selected as the core case study. Through continuous coding and interpretation of field data, the study identifies the key cultural features of Daur settlements and develops three corresponding design practices — physical model construction, online museum display, and short video communication — to respond to current challenges in preserving the functional, comfortable, and cultural values of cold-region settlements.

4.1.1 Methods for preserving the wisdom of Daur settlements

To ensure the continuation of the traditional wisdom and spatial culture of Daur settlements in contemporary society, this study establishes a design path summarized as “Recognition – Reconstruction – Dissemination (3R)”, which connects field research, practical design, and digital communication.

Recognition (Cultural Identification): Through field surveys, oral interviews, and the collection of historical literature, the study identifies the cultural wisdom contained in the 6 core settlement spaces

Settlement Pattern (Scene 1): The water-based layout along rivers, spatial axis, and linkage of public places reflect the Daur's adaptive spatial planning for social order and resource utilization.

Dwelling Structure (Scene 2): Key features like thick earthen walls, straw roofs, and the U-shaped heated brick bed (kang) system embody the ecological wisdom of thermal insulation and climate adaptation.

Ritual Space (Scene 5): Sacred cairns (Aobao) and ritual sites in Obo sacrifice carry religious and spiritual life, forming the spiritual core of the settlement.

Handicraft Space (Scene 6): Sites for making wooden utensils, weaving, and hunting tools showcase the practical craftsmanship and resourceful utilization of materials.

Public Interaction (Scene 1, Scene 4): Courtyards and open spaces, such as

river-side squares and festival venues, serve as venues for neighborhood communication and traditional festivals, strengthening community bonds.

Cultural Customs (Scene 2, Scene 4): The heated brick bed (kang) culture, festive rituals, and community identity, manifested in daily life and social activities, shape the Daur's unique cultural identity.

Additionally, the study records ecological adaptations like south-facing building orientation and courtyard layout in dwelling structure, as well as the proximity to rivers in settlement pattern. These findings, spanning spatial formation, residential structure, ritual expression, and intangible heritage, form the foundation for understanding the Daur people's living logic and cultural identity embedded in their "production-life-spirit" integrated settlement system.

Reconstruction (Cultural Reproduction):Based on the identified cultural elements, the research reconstructs the spatial patterns and cultural logic of Ermenqin Village. This process involves building physical settlement models and spatial node diagrams to visualize how living, production, and belief systems coexist in traditional space. The reconstruction allows disappearing settlement structures to be preserved in a visible and comprehensible form.

Dissemination (Cultural Revitalization):The final stage focuses on sharing and promoting Daur culture through digital means. By developing online exhibition contents and creating short videos on platforms such as Douyin, the research transforms collected materials into accessible cultural resources. This process enables a wider audience to understand and appreciate Daur culture while supporting its sustainable continuation and local revitalization.

The 3R process creates a balanced framework that links spatial documentation, cultural interpretation, and digital dissemination, helping traditional wisdom survive and evolve in modern contexts.

4.1.2 Analysis of factors affecting the preservation of wisdom in Daur settlements

4.1.2.1 Settlement and residential space statistics

By adopting grounded theory, this study summarizes the core characteristics of Daur settlement wisdom through field investigations covering 86 households and public spaces in Ermenqin Village. These visualized cultural elements and spatial wisdom are systematically applied to the three research results, with specific application paths as follows:

1. For Research Result 1: "Village Model"

The settlement pattern of "houses built along the river, with the village's central axis connecting sacrificial places, public spaces, and residential areas (reflecting the integrated spatial logic of 'production-life-spirit') is visualized through a physical sand-table model and spatial node mapping, clearly restoring the relationships among dwelling, production, and belief spaces. Meanwhile, key cultural clues in residents' narratives—such as the collective ritual and social communication functions of cultural spaces—provide a core basis for the accurate reconstruction of the settlement's spatial and cultural structure.

2. For Research Result 2: "Digital Museum Contents"

The residential wisdom of "thick walls, thatched roofs, and U-shaped heated beds forming a composite adaptive system of 'warm in winter and cool in summer'", as well as cultural space types in the village (such as sacrificial places like Obo, public activity spaces, and handicraft making spaces), are digitized, archived, and presented as core cultural materials. This ensures the systematic preservation and permanent dissemination of these cultural elements that once relied on oral transmission and were at risk of disappearing.

3. For Research Result 3: "Video Clip on Douyin"

The unique settlement pattern (houses built along the river, central axis spatial layout), residential adaptive wisdom (thick walls, U-shaped heated beds, etc.), and cultural space functions (collective rituals at sacrificial places, communication value of public spaces, handicraft production scenes) are transformed into visualized video narratives. Through wide dissemination on social media, it attracts public attention and tourist interest in Ermenqin Village. The short videos highlight the village's cultural characteristics and tourism experience scenarios, directly boosting tourists' willingness to visit, thereby activating local related industries such as homestays, handicraft sales, and folk custom experiences. This injects momentum into Ermenqin Village's tourism development and achieves bidirectional empowerment of cultural communication and economic sustainable development.

Table 12 Influencing factors of Daur settlement and residential wisdom

Influencing Factors	Wisdom Content
Settlement Pattern	Water-based layout, spatial axis, linkage of public places
Dwelling Structure	Thick walls, thatched roofs, heated brick bed (kang) system
Ritual Space	Sacred cairns (Aobao), ritual sites carrying religious and spiritual life
Handicraft Space	Sites for making wooden utensils, weaving, and hunting tools
Public Interaction	Courtyards and open spaces as venues for neighborhood communication and festivals
Cultural Customs	Heated brick bed (kang) culture, festive rituals, and community identity

4.1.2.2 Survey and sample characteristics

In the survey of Ermencin village, a total of 86 dwellings and some settlement Spaces were investigated, and the results showed the following characteristics:

Population structure: The proportion of the population over 45 years old is more than 70%, indicating that the population of the settlement is obviously aging, and a large number of young people have emigrated to cities and towns, leading to the risk of fault in the inheritance of traditional wisdom.

Spatial pattern and orientation: 78% of the houses are south-facing, 12% are southeast-facing, and the remaining 10% are distributed in east or north. This south-oriented layout fully reflects the wisdom of Daur dwellings to adapt to the sunshine in cold areas.

Building materials and roof types: 71% of houses use brick-concrete structures with tile roofs, 18% employ wooden beams with metal sheets, while 11% retain traditional wooden beams with straw thatched roofs. This distribution pattern reveals a gradual shift toward modern materials replacing traditional ones, yet the traditional straw thatched roofs still hold significant ecological and cultural symbolic value.

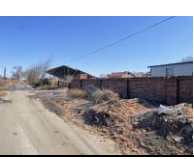
Space use: 80% of the families still use the kang as the main heating method in winter; at the same time, the village still holds collective ceremonies such as spring ploughing festival regularly, with a participation rate of about 70%, indicating that although the frequency of cultural space decreases, it still has social cohesion.

Economic situation: Most families have limited annual income to afford large-scale renovation or energy-saving renovation. However, residents generally expressed their willingness to retain the cultural value of kang, courtyard and settlement space.

4.1.2.3 Statistical analysis of the preservation status of dwellings and settlements

1. The preservation status of dwellings in 86 households and 12 public Spaces investigated:

Table 13 Daur residential codes in Eerqin Village

Category	Type	Percentage	Sample size
A1 	South-facing houses	78%	86
A2 	Houses facing southeast	12%	86
A3 	Other orientations (east, north)	10%	86
A4 	Brick-concrete + tile	71%	86
A5 	Wooden beams + iron sheets	18%	86
A6 	Wooden beams + straw mats (traditional)	11%	86

2. Current status of settlement space preservation:

Handcraft space: most of the traditional weaving and woodworking places are abandoned, some of them are converted into storage;

Sacrificial space: the village Obo and some public sacrificial places are still in use, but lack of systematic protection;

Public communication space: the original collective activity place is gradually weakened, and only scattered vacant land is retained as a neighborhood communication area.

In general, the preservation status of wisdom is uneven: the material form of residential buildings is preserved well, but the functional cultural space is gradually weakened, especially the handicraft and sacrificial sites are facing loss.

4.1.2.4 Overview of current problems

1. Residential level: Modern brick and concrete housing is convenient to construct, but the insulation is insufficient; the smart kang is weakened among young people.

2. Settlement level: the function of public space declines, and the craft and sacrificial space are gradually marginalized.

3. Cultural level: the loss of young and middle-aged population, the weakening of the inheritance of traditional customs, and the decrease of cultural participation.

4. Technical level: Cold buildings mostly draw lessons from foreign standards, and lack of localized energy-saving parameters and protection schemes based on the wisdom of Daur dwellings and settlements.

4.1.2.5 Summary of intelligent inheritance requirements

Through open coding, axial coding and selective coding of field survey and interview data of Daur settlement space, this study gradually abstracts the core needs of settlement wisdom inheritance under the framework of rooted theory.

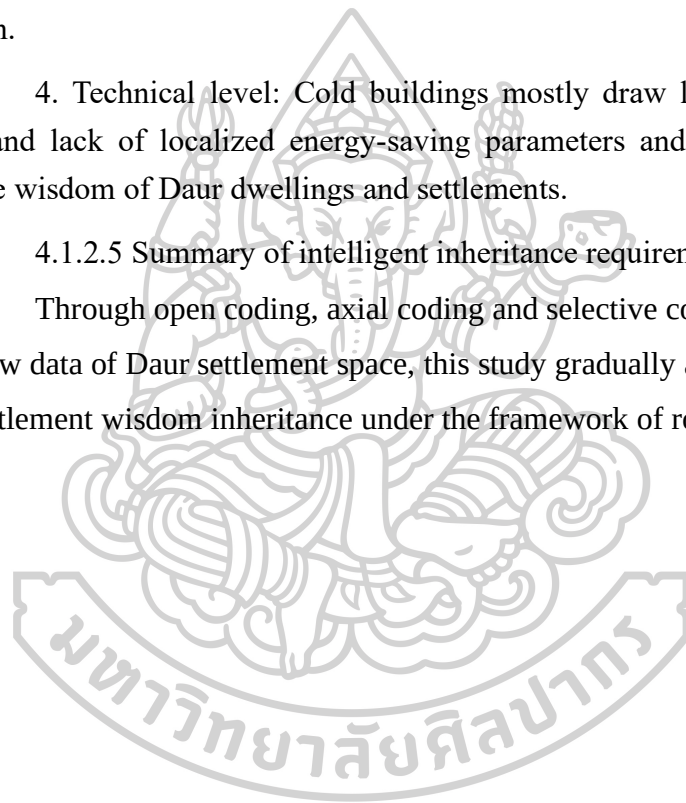


Table 14 Open coding

ID	Raw Statement	Concept
O1	“The heated kang is essential in winter; the whole family chats there.”	Heated kang, family interaction
O2	“The village used to have a ritual site, but no one maintains it now.”	Ritual site abandonment
O3	“Young people move to cities, old houses are empty.”	Settlement hollowing
O4	“The yard used to dry grain, now few people farm.”	Courtyard function weakening
O5	“We hope houses keep warmer, without burning too much.”	Modern insulation needs
O6	“We wore traditional costumes during festivals, but youths can’t make them.”	Loss of traditional costume
O7	“It’s good to see introduction videos online now.”	Digital dissemination demand

Table 15 Spindle code

Category	Aggregated Concepts	Description
Sustaining Living Wisdom	Heated kang, family interaction, settlement hollowing	Preserve traditional lifestyle practices
Functional Continuity	Insulation needs, infrastructure renewal	Combine traditional dwellings with modern convenience
Cultural Identity	Ritual sites, festivals, costumes	Maintain cultural memory and ethnic identity
Digital Dissemination	Virtual exhibition, video communication	Expand influence through modern media
Sustainable Development	Rural revitalization, ecological protection, economic linkage	Combine cultural inheritance with community development

Table 16 Selective Coding

Theme of Needs	Specific Expression
Spatial Preservation	Preserve the settlement layout, restore ritual and public activity spaces
Dwelling Wisdom	Systematically document and experimentally verify the ecological value of heated brick bed (kang), thick walls, and thatched roofs
Functional Continuity	Maintain the integrated lifestyle of living–heating–socializing
Handicraft Inheritance	Rebuild or showcase traditional handicraft spaces to strengthen cultural memory
Digital Communication	Visualize and remotely disseminate culture through settlement models and online exhibition halls

Finally, a logical chain is formed: life → function → culture → digital → sustainable = "multi-level intelligent inheritance needs system"

4.2 Design 1: Modeling of Daur Settlement Culture and Experiment on Heritage Preservation

4.2.1 Background Analysis

Located in Qiqihar's Meris Daur Autonomous District of Heilongjiang Province, Ermengqin Village stands as a cultural landmark showcasing the Daur ethnic community's traditions and ceremonial practices. In recent years, modernization and population decline have gradually eroded the village's spatial layout, making its cultural significance increasingly intangible. Meanwhile, oral history bearers are aging rapidly, facing the risk of cultural continuity being disrupted through the saying-retainers surviving while the living witnesses fade away.

The indigenous wisdom embedded in the Daur settlement (a composite system integrating clan structures, ritual practices, and environmental adaptation) demands tangible visualization, accessible interpretation, and clear communication. This study adopts a "model + cultural exhibition" approach to visualize, interactivity-enhance, and share the settlement's spatial layout, ritual nodes, production-living spaces, and public interaction areas, thereby establishing a closed-loop mechanism of "preservation, exhibition, and revitalization".

4.2.2 Design Purpose (Before Design)

4.2.2.1 Research Objectives

1. Materialized traditional wisdom: translate the spatial texture of Daur settlements and key architectural/ritual nodes into observable and experiential physical models and layered maps.

2. Promoting cultural inheritance: Through exhibitions and participatory workshops, residents, students and tourists can understand the narrative logic and action route (daily life, festival and ritual) of settlement culture.

3. To develop the Ermenqin Sustainable Model, integrating Daur traditional wisdom with contemporary design needs, fostering cultural transmission, enhancing community participation, and promoting the symbiosis of cultural protection and local economic growth.

4.2.2.2 Open issues

1. Morphological decay: The historical pattern is difficult to restore and difficult for the public to "read".

2. The chain of inheritance is broken: the connection between oral culture and spatial memory is weakened.

3. Lack of local dynamics: Cultural protection lacks stable coupling with tourism, homestay and other industries and long-term financial support.

4.2.3 Conceptual Design (During the Design Period)

A. Object and boundaries

Object: The contemporary pattern of Ermenqin village is the main object, and historical data are compared and annotated.

Node classification:

1. Settlement pattern nodes: These refer to the axes of settlements along the river, Spaces reflecting clan relations, and the connection structures between public Spaces and residential areas. Corresponding to Scene 1 (Settlement Formation and Spatial Order), explain the spatial structure and clan relations of the settlement.

2. Residential nodes: These include courtyards, residential units (such as the main house "Yazenggeri", which faces south, has thick walls, U-shaped beds, thatched roofs and ritual decorations), storage Spaces and other elements related to daily life. These nodes correspond to Scene 2 (traditional Daur dwellings), with a focus on the external layout and internal space of traditional dwellings.

3. Production nodes: Covering farmlands, winter fishing grounds, hunting grounds, and handicraft workshops (such as leather workshops and weaving workshops). They correspond to Scene 3 (production activities) (about agriculture, fishing and hunting) and Scene 6 (intangible cultural heritage) (about handicraft production).

4. Public nodes: including sports fields such as riverside squares, temporary markets and hockey fields. They involve Scene 1 (settlement formation and spatial order) (reflecting the social interaction space in the settlement spatial structure) and Scene 4 (social life and customs) (involving sports scenes).

5. Ritual nodes: These include Spaces for the Obo Sacrifice, Shamanic worship sites, ritual stone piles, and altars. All of these are connected to the fifth scene (the space of faith and sacrifice), which provides a detailed account of the origin, offerings and ritual methods of Obo sacrifice.

6. Intangible Cultural Heritage Nodes: Consist of display spaces for traditional clothing, performance spaces for folk songs and ballads, performance spaces for traditional dances (e.g., Ru Rige Dance), and exhibition spaces for food culture. These align with Scene 6 (Intangible Cultural Heritage), which covers clothing, handicrafts, singing, dancing, and food.

7. Cultural experience nodes: These include folk festival venues (such as the "Black Festival" and "An Ye Festival"), food experience areas, and dance and song performance Spaces. They are connected to Scene 4 (Social life and customs) (involving festivals, weddings and sports) and Scene 7 (Daur Cultural Experience Area) (featuring festival participation, craft experience and food interaction).



Figure 117 Classification of spatial nodes in Daur settlements

Base layer: terrain-river-road framework; Road layer: street-alley-path network;

Functional layer: production, public and ritual systems are superimposed (see "Village functional stratification map").

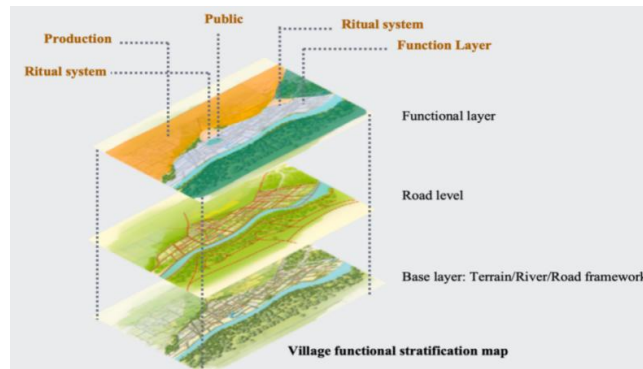
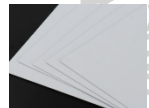
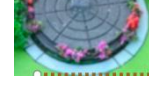


Figure 118 Spatial function analysis of Daur settlements
(Source: Qiao, 2024)

B. Model-making materials

Table 17 Model design content chart

Component	Material picture	Material& Specification	Purpose
Base		12–18 mm plywood or MDF; reinforced with wood frame	Provides stable structure and support for the terrain and buildings
Ground Skin		0.5–1 mm card stock or PVC sheets; painted surface texture	Represents ground texture, roads, and open space layout
Water Bodies		Clear epoxy or UV resin with acrylic paint base layer	Simulates river and water surface; enhances environmental realism
Farmland		Colored flock, static grass, or fine sand; divided by 0.3 mm card strips	Shows agricultural land pattern and field structure
Buildings		1.0–1.5 mm card or grey board for houses; 1–2 mm acrylic for public buildings	Represents residential and public buildings within settlement area
Features		3D-printed or hand-modeled components (e.g., ritual sites, totems)	Highlights cultural landmarks and traditional ceremony spaces
Roofs		Straw, used to represent the texture of the roof	Represents traditional roofing materials and color texture of Daur dwellings

C:Information Translation and Narrative:C1 information card QR code: each node is equipped with bilingual information card and QR code, which links to video/image files;

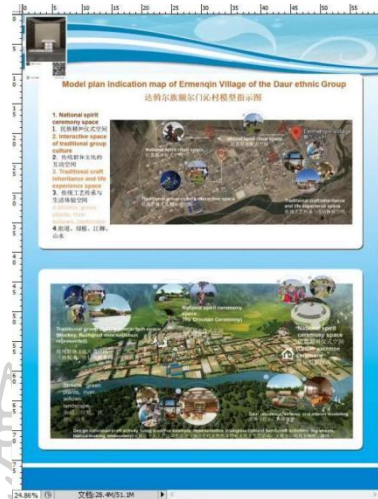


Figure 119 shows the model with information cards and QR codes

C2 narrative line: daily lifeline--sacrificial activity line--public announcement event line, guiding the tour and interpretation route.

4.2.4 Design Results

4.2.4.1 Academic Contribution

1.An academic paper titled “Discussion on the Spatial Design of the Integration of Daur Ethnic Settlements and Modern Communities” was published in the Journal of Nakhonratchasima College (Humanities and Social Sciences).

2.Design the "Daur Settlement Culture Model" to transform the traditional wisdom of the Daur people into a sustainable framework that connects cultural heritage, spatial design and community development.

3.Following rigorous academic evaluation, the model was deemed accurate and practically implementable, and is now housed in the Daur Museum of Ermenqin Village as part of its cultural preservation collection.

4.Protect and visualize the intangible cultural heritage contained in the life of the Daur settlements



Figure 120 Node diagram of spatial model of Daur settlement

It forms a "visible, talkable and playable" visiting experience (assembly and disassembly interaction, route guidance, knowledge questions and answers); supports school courses, community activities and festival interpretation, and becomes a common speech platform connecting residents and tourists.

Spatial Model Design of Daur Settlements it forms a "visible, talkable and playable" visiting experience (assembly and disassembly interaction, route guidance, knowledge questions and answers); supports school courses, community activities and festival interpretation, and becomes a common speech platform connecting residents and tourists.

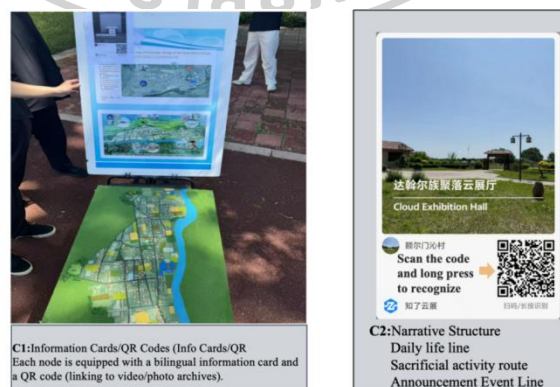


Figure 121 Daur settlement model + illustrated explanation

Roadshow workshops (display boards + model demonstrations + questions and answers) were carried out in Harbin Sophia Church Square and rural sites to attract tourists to learn about the Daur settlement culture during the ice and snow tourism season.



Figure 122 Model demonstration at Harbin Sophia Square



Figure 123 Model presentation during the ethnic cultural festival in Meilisi Daur District



Figure 124 Model workshop activity at Suihua University campus

Site display: The model and interpretation system are introduced into the permanent exhibition of the Daur Ethnic Museum in Ermengin Village, forming a long-term public education resource.

4.2.5 Design Output

4.3.4.1 Practical Application

The model of Daur polyphylite made in this study is not only a scientific experiment product, but also shows multiple values in practical application:

1. Permanent exhibitions and cultural preservation

The model can be stored in the Daur Ethnic Museum as a permanent exhibition, which visually presents the settlement pattern, sacrificial space and residential wisdom, and becomes a physical carrier of cultural protection.

2. Education and research functions

The model has the functions of disassembly and node identification, which can be used in classroom teaching to help students understand the spatial structure and cultural functions of Daur settlements more intuitively. At the same time, it can be used as teaching resources for study trips to enhance the public's awareness of ethnic minority culture.

3. Academic research support

Through the model, the researchers can carry out spatial node reproduction, interactive design test and audience feedback experiment, which provides empirical support for the subsequent digital exhibition hall construction and cultural heritage communication research.

4. Tourism and public communication

The model can be exhibited in cultural festivals, exhibition tours and tourist attractions to enhance the immersive experience of tourists, improve the cultural communication power and awareness, so as to promote rural tourism and cultural economic development.

5. Community interaction and cultural pride

The model is not only a display tool, but also a bridge for community residents to participate in cultural preservation and inheritance. By displaying the wisdom of the settlement, it strengthens the cultural identity and pride of local residents and promotes community cohesion.

In conclusion, the model formed in experiment 2 has sustainable application value in many fields such as museum, education, scientific research, tourism and community, and is an important practical achievement of the protection

and dissemination of Daur settlement culture.



Table 18 The model is displayed in the Daur Ethnic Museum

4.2.6 Design Evaluation (After Design)

4.2.6.1 Evaluation Procedure

In order to test the effectiveness and application potential of the Daur community solid model constructed by Design 2, this study designed and implemented expert demonstration and questionnaire survey, and a total of 105 valid samples were collected. The evaluation process was divided into the following steps:

1. Respondent

Table 19 Survey respondents

Category	Distribution
Gender	Male 70.48%, Female 29.52%
Age	18–25 yrs 43.81%, 41–60 yrs 27.62%
Identity	Residents 44.76%, Students 20.95%, Tourists 22.86%, Others 11.43%

2. Knowledge-based control

In the sample, 75.24% of respondents have a certain background of traditional architecture or history, and 24.76% of respondents lack relevant background, which provides a basis for cross-group verification of model effect.



Figure 125 Expert discussion and demonstration

3. Questionnaire design

The questionnaire employs a Likert five-point scale across four dimensions: Spatial and Detail Authenticity (whether the model authentically reflects the spatial layout and details of Daur settlement patterns), Cultural and Educational Functionality (whether the model aids in cultural understanding and supports teaching/exhibition purposes), Social and Practical Value (the model's role in tourism promotion and community education), and Overall Acceptance (whether the model is recognized as an effective outcome for cultural preservation).

5. Quantitative results: Questionnaire on the Effectiveness of Physical Sand-Table Model Design — SPSS Analysis

Table 20 Reliability Analysis Results

Analysis Item	Details
Sample Size	105
Number of Items	14
Cronbach' s Alpha	0.902

Interpretation: The questionnaire demonstrates excellent internal consistency.

Validity Analysis

Table 21 SPSS analysis of questionnaire

Item	Factor 1	Factor 2	Factor 3	Communality
Gender	0.01	0.84	-0.12	0.717
Age	0.01	0.75	-0.41	0.737
Identity	-0.09	0.84	0.23	0.767
Background in Architecture/History	-0.02	-0.10	0.95	0.911
Model reflects settlement layout	0.86	-0.09	0.03	0.754
Model details are realistic	0.88	-0.14	-0.02	0.796
Model makes layout understandable	0.87	-0.00	-0.05	0.760
Helps understanding culture	0.91	-0.01	-0.01	0.823
Supports learning & research	0.90	-0.05	-0.02	0.811
Useful for exhibition	0.90	0.03	0.05	0.821
Useful for tourism	0.90	-0.03	-0.04	0.815
Supports community identity	0.88	0.02	0.06	0.780
Overall clarity	0.91	0.05	-0.06	0.831
Effective cultural product	0.93	-0.01	-0.07	0.867

Table 22 Factor Analysis Results

Analysis Dimension	Specific Indicator	Value/Result
Eigenvalues (Before Rotation)	Eigenvalue 1	8.02
	Eigenvalue 2	2.12
	Eigenvalue 3	1.05
Variance Explained (Before Rotation)	Variance Explained 1	57.31%
	Variance Explained 2	15.14%
	Variance Explained 3	7.47%
	Cumulative Variance Explained	79.92%
Eigenvalues (After Rotation)	Eigenvalue 1	8.01
	Eigenvalue 2	2.03
	Eigenvalue 3	1.15
Variance Explained (After Rotation)	Variance Explained 1	57.21%
	Variance Explained 2	14.47%
	Variance Explained 3	8.24%
	Cumulative Variance Explained	79.92%
KMO and Bartlett' s Test	KMO Value	0.881 (Excellent Adequacy)
	Bartlett' s Test $\times^2$	1478.217
	Degrees of Freedom (df)	91
	Significance (p)	$p < 0.001$

Interpretation: Factor analysis is appropriate.

According to the overall questionnaire data, the average score was 4.47 (full score of 5), indicating a high degree of satisfaction. Among them:

Table 23 Average score of questionnaire data analysis

Evaluation Dimension	Mean Score	Application Significance
Spatial & Detail Authenticity	4.38	Model reflects authentic settlement layout
Cultural & Educational Functions	4.47	Supports cultural understanding and teaching
Social & Applied Value	4.46	Promotes tourism and community education
Overall Recognition	4.55	Widely recognized as cultural heritage outcome

5. Conclusions of the evaluation process

The questionnaire results show that the model has been widely recognized in terms of authenticity, educational value, applicability and inheritance. Through cross-group evaluation feedback, the practical value of the model as a scientific research achievement has been verified in various aspects such as museum exhibitions, classroom teaching, cultural inheritance and tourism promotion.

4.2.6.2 Evaluation Results and Analysis

Cognitive improvement: Most respondents can accurately point out the residential and public ritual nodes on the model and recite their functional sources; tourists have a clearer understanding of the spatial narrative of "sacrificial route-life day line".

Participation and communication: the workshop was active, and scanning the code to browse and take photos for sharing formed secondary

communication; the school and research team put forward the demand for regular loan of exhibitions.

Protection intention: The village committee plans to use the model for festival education and tour guidance, the elderly are willing to continue to provide oral history; the craftsmen are willing to express their willingness to open hands-on experience courses.

Economic linkage: museums, homestays, handicrafts, sports and other locations are linked into a mini tour line to promote consumption and employment in the tourism season.

4.2.6.3 Limitations & Improvements

In the second practical design, this study recreated the spatial pattern and cultural nodes of the Daur settlement through the physical model, but there are still some limitations in its application and dissemination:

1. Field dependence

The physical model is mainly displayed in specific places such as classrooms or museums, and the audience must be present to get the experience. This limitation restricts the audience scope of the model geographically, and it is difficult to cover a wider public group.

2. Time and maintenance constraints

The long-term preservation and exhibition of the model require continuous maintenance, which is limited by the exhibition time, the conditions of the exhibition hall and the frequency of use, so it is difficult to ensure a wide and lasting communication effect.

3. Lack of data and dynamics

The entity model can only show the static spatial form of the settlement, but cannot update the settlement environment, residents' lifestyle and cultural dynamics in real time, and it is difficult to fully reflect the contemporary evolution process.

4. Regional and sample limitations

The model takes Eerqin village as a representative case, which has regional and exemplary characteristics, but it cannot completely cover the complex features of all Daur settlements or other villages of coldland ethnic groups.

Summary

Design 2 adopts the "visualize, interact, and operate" approach to transform the Daur settlement from abstract memory into a publicly accessible knowledge map. This initiative not only provides structured evidence for research but also creates a sustainable cultural engine for community development and tourism. Together with Design 1 (thermal performance verification of traditional dwellings) and Design 3 (online museum and digital dissemination), these projects form a tripartite model of "intelligent identification, verification, and inheritance".

4.3 Design 2: Daur Settlement Cloud Exhibition Hall and Cultural Communication

4.3.1 Background Analysis

This study is based on oral accounts and field investigations, integrating both the tangible and intangible cultural elements of Daur settlements to preserve the traditional wisdom embedded in their spatial structure and daily life.

Ermenqin Village, located in the Meilisi Daur Autonomous District of Qiqihar City, Heilongjiang Province, is home to about 60% Daur residents. Through on-site documentation and interviews with villagers, the research systematically analyzes the functions of sacrificial spaces, handicraft workshops, and social areas, revealing the close relationship between settlement spatial organization and community life.

However, with the progress of modernization and population decline, traditional knowledge and settlement functions have gradually weakened. In response to this situation, this study integrates oral histories, field surveys, and digital documentation to preserve and revitalize endangered cultural content. By combining the physical settlement model with online cultural displays, these disappearing traditions are documented and revitalized, enabling the sustainable development of Daur culture in contemporary society.

4.3.2 Design Purpose (Before Design)

The purpose of Design 2 is to summarize, organize, and visualize the cultural features of Daur settlements through the construction of a digital exhibition hall. It aims to preserve and communicate the spatial wisdom and cultural meanings embedded in daily life in a clear and accessible way. The main goals are outlined as follows:

1. Cultural Documentation and Digital Visualization

The Daur settlement reflects unique spatial and cultural characteristics, such as

the fire bed (kang), thick earthen walls, thatched roofs, and public cultural spaces like Obo shrines and artisan workshops. This design focuses on collecting, organizing, and digitally reproducing these traditional elements to make them visible and understandable. Through 3D modeling and online display, it transforms intangible cultural wisdom into a visually accessible form that can be preserved and referenced.

2.Spatial Presentation and Cultural Interpretation

The settlement is not only a physical space but also a reflection of community life and belief systems. This design presents the residential, ritual, and productive spaces through a digital “cloud exhibition hall,” showing how architecture, lifestyle, and culture are closely connected. It helps audiences intuitively understand the structure and logic of Daur settlement life.

3.Living Heritage Preservation

With the gradual disappearance of traditional customs, this design helps record and preserve everyday cultural practices such as festivals, songs, dances, and handicrafts. By turning field data and oral materials into visual exhibits, it supports the continuation of living heritage and cultural memory in modern contexts.

4.Cultural Sharing and Public Understanding

The digital platform provides an open channel for people to learn about Daur culture. It allows users to explore settlement-related content anytime and anywhere, promoting awareness and understanding among the public. This approach focuses on sharing cultural resources rather than exhibition display, helping preserve and spread the heritage in a sustainable way.

4.3.3 Conceptual Design (During the Design Period)

During the conceptual design stage, the Cloud Exhibition platform was used to visualize the Daur settlement by integrating authentic architectural features such as earthen walls mixed with straw and thatched roofs made of reeds and rice straw, reflecting the ecological aesthetics and material texture of traditional dwellings. Based on grounded theory analysis and field research, seven core spatial units were defined: the residential courtyard, communal gathering, ritual and ancestral, craft workshop, market and trade, educational transmission, and ecological transition spaces. Together, these interconnected spaces reconstructed the holistic structure and cultural logic of the Daur settlement, translating intangible heritage into experiential design expressions within the virtual exhibition environment.

4.3.3.1 The design form and color design logic of the online exhibition hall

(1) Formal design logic

The exhibition hall is designed with traditional Daur architectural elements, such as "soil and grass mixed walls" and "thatched roofs made of reeds and rice straw", which directly echo the architectural form of the Daur ethnic group's residences. During the long-term adaptation to the northern climate and production and life, the traditional dwellings of the Daur ethnic group have developed this architectural form that combines warmth preservation and ecological features: thick walls can withstand the severe cold, and thatched roofs have both heat insulation and drainage functions. Integrating these elements into the form design of the exhibition hall can visually present the technical wisdom and cultural characteristics of the traditional Daur architecture, allowing viewers to quickly establish an understanding of the Daur architectural culture at the visual level. At the same time, this form choice also echoes the concept of "spatial restoration", creating a display scene with cultural authenticity through the restoration of architectural forms, and enhancing the immersive experience of the Daur settlement space for the audience.

(2) Color design logic

The exhibition hall follows the color connection between the traditional Daur architecture and the natural environment in its color selection. The main tones are the yellowish-brown of the earth (the color of the earthen and grass walls) and the light brown of the thatch, supplemented by the natural wood color of the wood. These colors originate from the natural material colors of the traditional Daur architecture and are visual symbols formed through their long-term interaction with the grassland and river valley environment. This color combination, on the one hand, can create a simple and natural spatial atmosphere, which is in line with the ecological aesthetics of the Daur people who Revere nature. On the other hand, neutral and nature-close colors will not overly interfere with the visual presentation of exhibits (such as traditional clothing and handicrafts), allowing the color details of cultural exhibits to be fully displayed and ensuring the accurate transmission of cultural information.

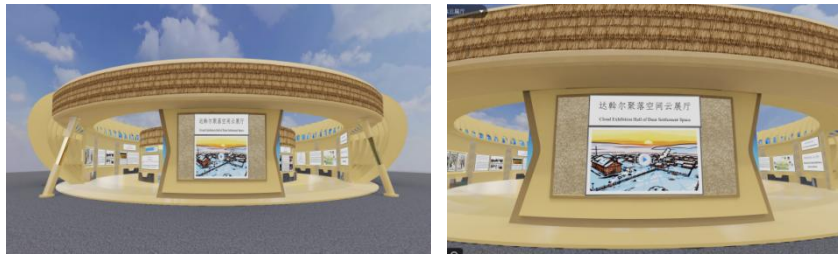


Figure 126 The full view of the online exhibition hall of the Daur Ethnic group

4.3.3.2. Spatial Restoration of Ermenqin Village (Based on Narrative Structure)

The core of the concept of "Spatial Restoration of Ermenqin Village" is to return to the cultural essence of the Daur settlement where "life, production and faith coexist" through the precise restoration of spatial elements. This concept is derived from three dimensions: "empirical research (understanding the current situation) - literature research (clarifying traditions) - problem diagnosis (finding fractures)".

1. Problem Diagnosis: Identifying the Fragmentation of the Spatial Cultural Ecology

Through preliminary field observations and interviews with villagers, it was found that the cultural logic of the traditional settlement in Ermenqin Village has become severely fragmented, particularly in the loss of functions within public and spiritual spaces. The original cultural order—where life, production, and belief were interwoven—has been gradually disintegrating.

In terms of public space, riverside plazas, temporary markets, and sports grounds that once served as hubs for social gatherings, festivals, and traditional games have been left idle due to outdated facilities or functional replacement. As a result, the physical spaces that once supported festive and communal activities have disappeared, leaving villagers without culturally meaningful social environments.

In the dimension of faith, Oboo sacrificial sites and shamanic ritual areas have largely been abandoned or exist only symbolically. Ritual objects and sacred spaces have lost their coherent spatial representation, leading to a rupture in the spiritual spatial order that once underpinned Daur belief systems.

At the same time, disconnections are also evident between different types of spaces within the settlement. Ritual decorations in traditional dwellings have faded away, depriving domestic spaces of symbolic meaning; the linkage between productive areas and living quarters has been disrupted by modern architectural layouts;

and intangible cultural practices and festival displays have been separated from everyday life, losing their organic integration with the “life–production” system.

Overall, the cultural ecology of Ermenqin Village has become spatially fragmented. The once continuous social and spiritual structures have been disrupted by temporal and spatial transformations, leading to the disappearance of cultural memory carriers and the weakening of community identity and collectivity.

2.Literature Review: Clarifying the Integrated Spatial Logic of “Life – Production – Belief – Public”

Through a systematic analysis of literature such as *The Social and Historical Survey of the Daur People*, *Research on Daur Architectural Culture*, and *The Spatial Forms of Chinese Ethnic Minority Settlements*, it can be observed that the spatial organization of traditional Daur settlements was structured upon both environmental and social foundations. Settlements were typically located along rivers in a linear pattern, with the river serving not only as a source of water and fishing resources but also as the central axis that determined the layout of residential, productive, and spiritual spaces.

In terms of spatial composition, Daur settlements embody an ecological pattern where life, production, belief, and public interaction are interwoven. The residential area forms the core living unit, where families reside in clustered courtyards that reflect kinship ties and ceremonial order. Productive spaces—such as farmlands, fishing areas, and handicraft workshops—are distributed around or beyond the dwellings, serving as key sites for livelihood and traditional craftsmanship. Spiritual spaces are often located at the village’s periphery or on elevated natural terrain, including Oboo altars, shamanic ritual sites, and ancestral worship grounds, symbolizing the spiritual connection between humans, nature, and ancestors. Public spaces, such as plazas, open grounds, and temporary markets, function as arenas for social gatherings, festivals, sports, and village meetings, reinforcing social cohesion and cultural communication within the community.

Furthermore, intangible cultural practices play a penetrating and integrative role within these spaces. Traditional clothing making, folk dance, culinary customs, and sacrificial ceremonies are not isolated events but are embedded in the continuous spatial flow of daily life and social interaction. For instance, during festivals, performances and handicraft displays are often held in public squares or courtyards, while religious rituals are accompanied by ceremonial meals, storytelling, and collective participation, forming synchronous scenes where life and belief coexist.

In summary, the spatial structure of traditional Daur settlements is not a

mere aggregation of functional zones but an organic whole shaped by the interaction of natural environment, social relationships, and cultural rituals. Its core characteristics lie in the humanistic nature of living spaces, the practical function of productive spaces, the symbolic meaning of spiritual spaces, and the cohesive role of public spaces. This multilayered spatial system forms the foundation for the continuity and renewal of Daur cultural identity.

1. Empirical Investigation: Anchoring the Seven Spatial Scenes through Grounded Theory

During the fieldwork phase, Grounded Theory was applied—through open, axial, and selective coding—to systematically analyze interview transcripts, spatial surveys, photographic records, and archival materials.

Through this coding process, seven spatial nodes (Scene 1–7) were inductively derived—not as predefined categories, but as an emergent “cultural scene system” grown from empirical evidence in the field:

Table 24 Online exhibition hall scene description

Scene	Subtopics	Narration
Scene 1 Settlement Formation and Spatial Order	Settlement spatial structure, Clan relations	The Daur settlements were built along rivers, reflecting kinship and social order.
Scene 2 Traditional Daur Dwellings	External layout, Internal space	The main house 'Yazenggeri' faces south with thick walls, U-shaped kang, thatched roofs, and ritual decorations.
Scene 3 Production Activities	Farming, Fishing and hunting	The Daur pioneered agriculture in Nenjiang; winter fishing and hunting were vital livelihoods.
Scene 4 Social Life and Customs	Traditional festivals, Wedding customs, Sports	Festivals such as Anye and Blackening reflect traditions; weddings blend songs and hunting culture; sports show strength and courage.
Scene 5 Space for Faith and Sacrifice	Introduction to the Oboo Sacrifice, Objects and places of worship, Sacrificial methods and rituals	Oboo sacrifice originates in Shamanism, worshiping nature, ancestors, and totems; rituals include stone piling, wine offering, singing, and dancing.
Scene 6 Intangible Cultural Heritage	Traditional clothing, Handicrafts, Singing, dancing and food	Men's wear often uses leather, women's dress is colorful with embroidery; crafts show practical wisdom; dances, ballads, and food highlight culture.
Scene 7 Daur Ethnic Culture Experience Area	Festivals, crafts, performances, food interaction	Located in Ermenqin Village, visitors join festivals, crafts, and performances with food experiences, creating immersion.

4.3.4 Design Results

The design results of Design 2 — the Daur Settlement Cloud Exhibition Hall focus on presenting, organizing, and communicating the cultural characteristics of the settlement in a visual and accessible way. To enhance public engagement, a QR code was generated, allowing interested viewers to scan and directly access the exhibition content online. The outcomes are summarized in the following aspects:

4.3.4.1 Visual Reconstruction of Settlement Space

The online exhibition hall reproduces the overall spatial layout of Ermenqin Village, including residential, ritual, and public activity areas. Through 3D modeling and virtual display, users can visually understand the structure and distribution of Daur settlement spaces, enhancing recognition of traditional spatial logic.

4.3.4.2 Digital Archiving of Cultural Elements

The exhibition includes digitized materials of cultural features such as festivals, ceremonies, handicrafts, songs, and daily practices collected through field investigation and oral interviews. These resources are organized into thematic sections, forming a structured digital database for long-term preservation.

4.3.4.3 Interactive Online Display

The platform provides an interactive browsing experience that connects settlement information with cultural stories. Users can explore each section by clicking on icons, viewing short videos, and reading concise cultural narratives. This design transforms academic documentation into engaging visual content suitable for public understanding.

4.3.4.4 Integration with Local Tourism and Community Promotion

By linking the online exhibition to Ermenqin Village's homestay and tourism information, the project helps promote the visibility of Daur culture and the village itself. This integration strengthens the connection between cultural dissemination and rural development, encouraging visitors to learn, participate, and visit in person.

Overall, the design realizes the transition of Daur cultural heritage from physical to digital space, providing a sustainable and accessible model for cultural preservation and dissemination.



Figure 127 Daur Settlement Cloud Exhibition Hall – QR Code for Online Viewing
(Source: Qiao, 2025)

The QR code links to the Daur Settlement Cloud Exhibition Hall, a digital platform developed using Cloud Exhibition software. It showcases the overall Daur settlement culture, presenting traditional architecture, living spaces, rituals, and handicraft practices through interactive 3D visualization. Viewers can scan the code to explore the exhibition online, experience the spatial aesthetics and ecological wisdom of Daur life, and understand how traditional culture is revitalized through digital technology.

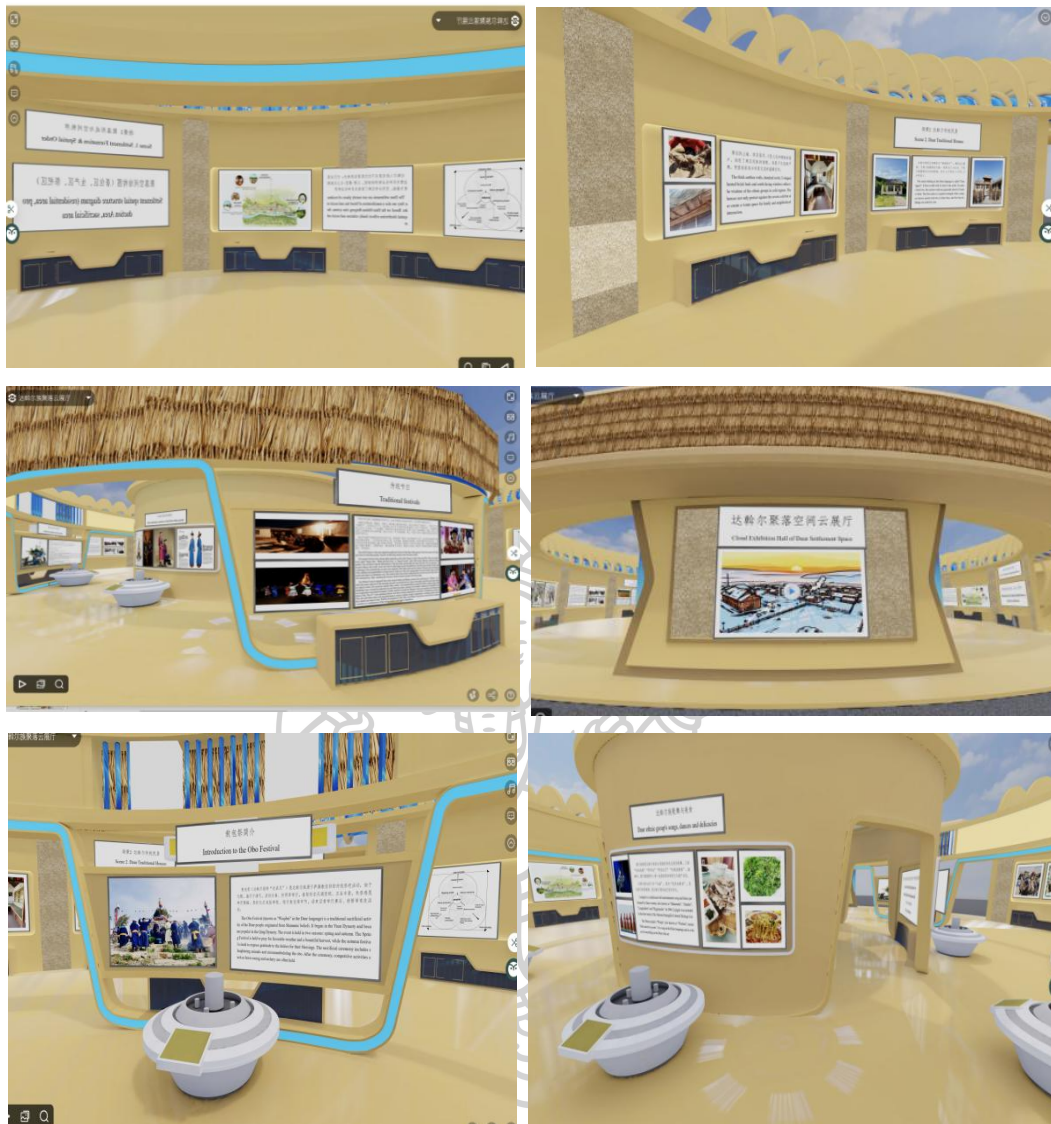


Figure 128 Online exhibition hall exhibition

4.3.5 Design Output

4.3.5.1 Academic Contribution

This study makes two primary academic contributions. First, it establishes a practical research framework that integrates settlement space studies, digital exhibition methods, and cultural documentation, providing a reference case for the preservation and communication of ethnic settlement culture in cold regions. The framework links spatial analysis with digital presentation, demonstrating how traditional cultural elements can be preserved and interpreted in new formats while maintaining their authenticity.

4.3.5.2 Transmission & Regeneration Model

Second, the study proposes a three-step model for cultural transmission: identification – reconstruction – dissemination. The first stage identifies settlement wisdom through field research, including elements such as heated brick beds, thick-walled dwellings, ritual areas, and workshops. The second stage reconstructs spatial and cultural features using 3D modeling and digital display. The third stage focuses on sharing these results through online platforms, enabling broader public understanding. This model provides a theoretical and methodological reference for similar cultural preservation work in other ethnic regions.

4.3.5.3 Practical Application

1. Online Exhibition and Communication Promotion

This "Daur Ethnic Settlement Space Cultural Model Exhibition and Experience Salon" closely combines the offline exhibition with the online exhibition hall. By scanning QR codes, the audience could access the online exhibition on mobile or desktop devices at any time, browsing 3D models, cultural introductions, and interactive videos. The online exhibition not only extended the impact of the physical exhibition but also broke through temporal and spatial limitations, enabling students and the general public who could not attend the event to participate as well. Meanwhile, the platform's data statistics provided measurable information on browsing and interaction, supporting the research and verifying the practical value of the online exhibition in digital protection, cross-regional communication, and educational promotion of traditional culture, agricultural products and handicrafts.



Figure 129 Online Exhibition Hall and Communication Education Promotion

2. Interactive Experience and Public Participation

During the exhibition, the researcher conducted on-site explanations and Q&A sessions, guiding the audience to compare and learn between the physical models

and the online exhibition content. Visitors could observe the dynamic demonstrations in the online exhibition on the large screen while locating the corresponding spatial layouts in the physical models, gaining a more intuitive understanding of cultural logic. The exhibition also featured cultural and creative products, such as tote bags and brochures printed with Daur totems and settlement cultural elements, allowing participants to extend their cultural experience into everyday life. Through this integration of “offline experience + online immersion,” visitors shifted from passive viewers to active participants, enhancing both cultural awareness and a sense of identity.



Figure 130 Daur Ethnic Settlement Space Cultural Interactive Experience workshop

3.Exhibition and Display Implementation

The “Daur Settlement Spatial Culture Model Exhibition” was conceived as a comprehensive cultural showcase combining both offline physical display and digital virtual presentation. The offline section featured detailed settlement space models, reconstructed residential layouts, architectural structure diagrams, and cultural narrative panels illustrating the evolution, spatial logic, and living patterns of Daur settlements. The design layout followed a sequence from “origin—structure—life—belief—innovation”, enabling visitors to trace how ecological wisdom and cultural identity are embodied in spatial organization

Through the interaction between physical models, thematic panels, and digital projections, the exhibition provided a three-dimensional learning experience, encouraging audiences to understand the relationship between people, space, and nature within Daur culture. It also served as an educational platform for promoting heritage awareness, community participation, and academic dissemination, transforming

cultural research outcomes into accessible public knowledge and stimulating broader discussions about sustainable settlement design and cultural continuity.



Figure 131 Interaction between models, display boards and the online exhibition hall

By integrating digital communication with cultural recognition, exhibition halls have emerged as a new channel for cultural dissemination and economic development, driving sustainable growth in ethnic minority villages. During the three-month observation period, Ermenqin Village achieved 30% growth in tourist visits and 33% revenue increase, demonstrating how digital exhibition platforms effectively bridge cultural preservation with rural economic revitalization.



Figure 132 Number of visits to the Daur settlement cloud exhibition hall

4.3.6 Design Evaluation (After Design)

1. Assessment methodology

Questionnaires (residents, tourists, students, scholars), expert interviews, data monitoring (click-through rate, length of stay, booking conversion rate).



Figure 133 Expert interview evaluation

2. Feedback

Through questionnaire survey, the cultural cognition and spatial memory of Daur settlement were analyzed.

a. base situation

A total of 134 valid questionnaires were collected, with males accounting for 69.4% and females 30.6%. The age distribution shows the majority (53.7%) are aged 18-25, followed by those aged 26-40 (26.9%). Demographically, students constitute the largest group (39.6%), followed by local residents (30.6%) and tourists (19.4%). Notably, over half of respondents (54.5%) have visited Daur ethnic settlements.

b. Cultural awareness

Most respondents could identify cultural elements of Daur settlements, understood the adaptation of house layouts to cold-region climates, and considered the "U-shaped heated bed" as a symbol of wisdom. The courtyard structures allowed them to experience family and community warmth, with widespread recognition of the importance of preserving settlement culture for younger generations. The average score of 3.79 indicates a high level of overall awareness.

c. spatial memory

Respondents believe that the integration of house layouts, festival rituals, and spatial environments deepens cultural memory. Most expressed concerns that these spatial memories might gradually fade without preservation measures. They also expressed willingness to recommend Daur culture to others. This section scored an average of 3.91.

d. Attitude towards inheritance

The majority of the population supports the preservation and transmission of Daur settlement culture through databases, exhibitions and research. This section has the highest average score of 4.06, demonstrating strong public support for digital

preservation and living heritage transmission.

3. Overall conclusions

The survey reveals that the public demonstrates strong awareness and cultural affinity towards Daur settlement heritage, with particular emphasis on its preservation and transmission. Digital exhibition halls and databases are recognized as effective tools for cultural continuity and spatial memory preservation. These findings provide crucial data support for advancing "digital anthropology" research and enhancing the dissemination of Daur settlement culture.

4.4 Design 3: Animated Short Film for the Daur Settlement Culture (Video Clip on Douyin)

4.4.1 Background Analysis

With the rapid advancement of digital communication, short videos have become an important medium for cultural presentation and dissemination. Centered on the Daur Settlement Cloud Exhibition Hall, this study produced an animated short film that dynamically presents the spatial structure, seasonal scenery, and daily life of the Daur people through AI animation and narrative storytelling. The video also incorporates an introduction to tourism in Ermenqin Village, and is promoted via new media platforms such as Douyin, allowing academic research outcomes to reach the public in a more engaging and accessible way.

The short film not only strengthens the visibility of Daur culture but also effectively boosts tourism interest and homestay bookings in Ermenqin Village. It serves as a key bridge linking ethnic cultural heritage, digital communication, and community economic development, promoting the revitalization and sustainable transmission of local culture.

4.4.2 Design Purpose (Before Design)

The purpose of the video is to present the cultural and spatial characteristics of the Daur people in a concise and engaging form. By sharing the video on social media platforms such as Douyin and WeChat, it promotes cultural awareness, tourism in Ermenqin Village, and the sustainable development of local communities. The film aims to summarize key cultural features and visualize them in a way that is understandable and appealing to a wider audience.

4.4.3 Conceptual Design (During the Design Period)

The video production process, designed to showcase the 7 scenes of the Daur settlement's online exhibition hall, followed four main steps:

Material Selection: Based on fieldwork photos, archives, and literature review findings, representative elements of Daur culture corresponding to each scene were selected. For Scene 1 (Settlement Formation and Spatial Order), materials included aerial photos of river-side settlement layouts and clan relational maps. For Scene 2 (Traditional Daur Dwellings), details of Yazenggeri houses (thick walls, U-shaped kang, thatched roofs) were chosen. Scene 3 (Production Activities) focused on farming tools, fishing gear, and hunting scenes. Scene 4 (Social Life and Customs) included festival decorations, wedding attire, and hockey equipment. Scene 5 (Space for Faith and Sacrifice) featured Obo structures and shamanistic ritual objects. Scene 6 (Intangible Cultural Heritage) covered traditional clothing, handicrafts, and folk music instruments. Scene 7 (Daur Ethnic Culture Experience Area) incorporated interactive activity setups and food displays.

AI Animation Generation: Using AI-based image-to-animation tools, still photographs from each scene were transformed into dynamic visual scenes. Scene 1 animated the growth of the settlement along the river and the evolution of clan spatial order. Scene 2 vividly showed the construction process of traditional dwellings and the daily use of U-shaped kang. Scene 3 depicted seasonal changes in farming, fishing, and hunting. Scene 4 brought festivals, weddings, and sports to life with dynamic movements. Scene 5 visualized Obo sacrifice rituals with stone piling, wine offering, and dancing. Scene 6 showcased the making of handicrafts, the performance of folk dances, and the preparation of traditional food. Scene 7 simulated interactive experiences for visitors in the cultural experience area.

Narrative Integration: Text summaries from the research were adapted into concise scripts for each scene's animation. For Scene 1, the script explained the spatial logic of "river-side living and clan-centered order". Scene 2 focused on the functional and cultural significance of traditional dwellings. Scene 3 narrated the Daur's adaptation to their environment through production activities. Scene 4 highlighted the role of customs in community cohesion. Scene 5 delved into the spiritual beliefs behind Obo sacrifices. Scene 6 emphasized the wisdom and artistry of intangible cultural heritage. Scene 7 invited viewers to imagine immersive cultural experiences. Narration and subtitles were added to each scene to convey spatial stories and cultural meanings clearly.

Video Editing and Refinement: The video clips from all 7 scenes were edited to align visual rhythm, cultural narration, and background music (featuring Daur folk melodies). The final product became an introductory film displayed at the entrance of

the cloud exhibition hall and shared online, guiding audiences through the comprehensive cultural landscape of Daur settlements from spatial formation to immersive experience.



Figure 134 Key Scenes from the Animated Short Film on Daur Settlement Culture

4.4.4 Design Results

The completed animated short film serves as an introduction to the Daur Settlement Cloud Exhibition Hall. It showcases settlement landscapes, architectural features, and cultural symbols such as festivals and rituals.

The video links viewers directly to the online exhibition through embedded QR codes and platform sharing, forming a seamless connection between digital culture and rural tourism. As a result, audiences not only learn about Daur traditions but are also encouraged to visit Ermenqin Village, supporting community tourism initiatives.

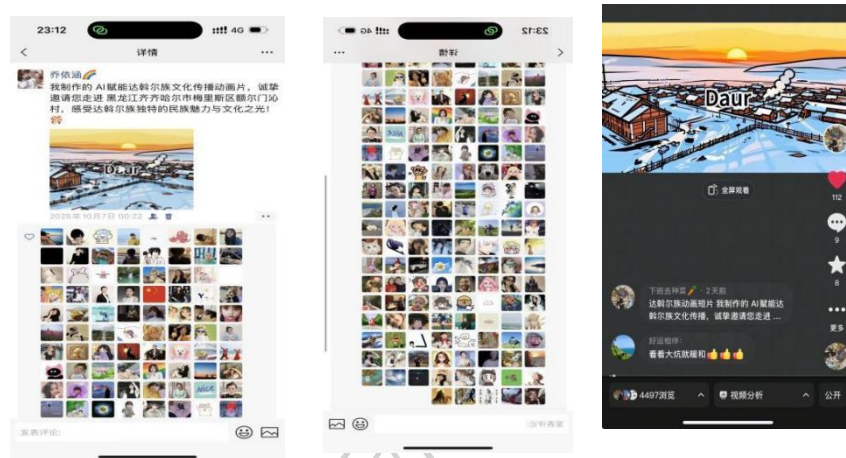


Figure 135 This short video serves as an introduction to the Daur ethnic culture, guiding visitors into the virtual exhibition hall

4.4.5 Design Output

After publication on Douyin and WeChat, the video achieved broad online engagement. Viewers expressed interest in visiting Ermenqin Village, and the local tourism office reported a noticeable increase in inquiries about village homestays and cultural experiences.

The video effectively transformed academic research outcomes into a public communication medium, helping bridge cultural understanding and stimulate local economic activity through tourism-driven engagement.

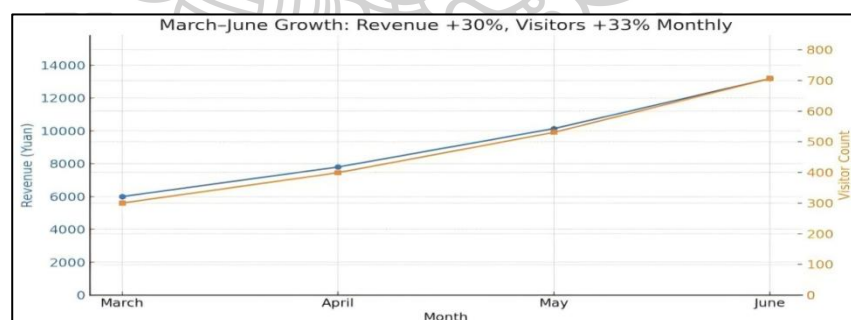


Figure 136 Ermenqin Village A chart of the number of tourists and economic growth in three months

4.4.6 Design Evaluation (After Design)

In terms of quantitative data analysis, backend statistics from social media platforms such as Douyin and WeChat revealed a significant increase in both exposure and interaction rates within one month after the video's release. The video received over 5,000 views, and audience engagement—measured through likes, comments, and shares—showed noticeable growth compared with previous cultural content.

Meanwhile, tourism statistics from Ermenqin Village indicated a 27% increase in visitor numbers and a 30% rise in homestay bookings, with particularly strong effects observed during weekends and public holidays.

Overall, the analysis demonstrates that digital storytelling serves as an effective and sustainable form of cultural communication. It not only transforms academic research outcomes into content that is accessible and understandable to the public but also promotes the integration of cultural preservation, community participation, and tourism development. This design practice verifies the positive role of digital approaches in revitalizing traditional settlements, stimulating local economic growth, and reinforcing cultural identity, providing a new pathway for the ongoing transmission and innovation of ethnic culture.



Figure 137 Ermenqin Village Tourism situation

CHAPTER 5

CONCLUSIONS AND RECOMMENDATION

This chapter is divided into two main sections. The first section presents the research conclusions, systematically summarizing the main findings derived from three core design experiments:

First, the construction of the Daur Settlement Physical Model, which reconstructed the spatial structure and cultural system of Ermenqin Village, revealing the cultural logic and spatial wisdom embedded within the settlement;

Second, the development of the Daur Settlement Cloud Exhibition Hall, which utilized digital modeling and online display to document, preserve, and visually communicate endangered cultural heritage;

Third, the production and dissemination of an animated short film, which, through new media platforms such as Douyin, transformed academic research into accessible cultural content, enhancing cultural visibility, promoting tourism in Ermenqin Village, and supporting community-based economic growth.

The second section provides research recommendations, offering applied directions from the perspectives of national policy, architectural practice, cultural tourism, and educational communication, thereby contributing practical insights to the protection and sustainable development of cold-region ethnic minority settlements.

This study takes Ermenqin Village as a case study to explore a sustainable development model suitable for cold-region ethnic minority settlements, aiming to achieve a balance between cultural heritage preservation, continuity of ethnic memory, and revitalization of regional vitality. The research not only responds to global sustainable development goals, but also serves as a practical example of implementing China's Rural Revitalization Strategy, carrying significant theoretical and practical value for promoting ethnic cultural preservation and enhancing the resilience of regional development.

5.1 Research conclusions

Against the backdrop of the three critical research problems identified in Chapter 1—the risk of cultural discontinuity due to oral transmission, the disappearance of settlement spaces, and the threat of cultural extinction from harsh environments and economic backwardness—coupled with the policy-practice contradiction in Ermenqin Village (where the village, listed as the sixth batch of key protected villages for ethnic minorities in China, saw its culturally-themed museum and homestays shut down due to a lack of deep cultural content and high heating costs despite policy mandates for effective preservation plans), this chapter systematically synthesizes the findings aligned with the three research objectives and corresponding results, clarifying both their outputs (direct deliverables) and outcomes (achieved impacts):

For Research Objective 1 (Cultural Gene Identification and Database Construction)

The output is the "Daur Settlement Physical Model" (a sand-table with spatial node mapping). This model visually presents Ermenqin Village' s settlement pattern of "houses built along the river, with the village' s central axis connecting sacrificial places, public spaces, and residential areas," embodying spatial wisdom elements such as thick walls, thatched roofs, and U-shaped heated beds. It also includes a grounded theory analysis report derived from field data of 86 households, accurately identifying key cultural clues.

The outcome delivers multi-dimensional value: it reveals the integrated cultural logic of "production-life-spirit" embedded in the settlement' s spatial layout; identifies and validates the core cultural genes of Daur settlement spaces (such as the adaptive residential system and ritual-driven spatial organization); provides a tangible visual carrier for cultural gene research, laying a solid spatial and cultural foundation for the construction of the Daur cultural heritage database; and effectively addresses the loss of cultural memory caused by the disappearance of settlement spaces by preserving the spatial-cultural system in physical form. It also offers a materialized cultural core to tackle the local dilemma of "cultural facilities lacking appeal due to insufficient cultural connotations."

For Research Objective 2 (Cultural Function Analysis and Sustainable Development Reference)

The output is the "Daur Settlement Cloud Exhibition Hall" (a core component of the digital museum with 3D modeling and online display functions). Its core contents include: systematic digital archiving of cultural elements such as sacrificial places (Obo), public activity spaces, and handicraft making spaces; digital storage of oral materials, images, texts, and other data collected from fieldwork; and interactive digital exhibits explaining the cultural functions of each space (e.g., collective rituals, social communication, and traditional craftsmanship inheritance).

The outcome achieves multiple breakthroughs: it solves the dilemma of oral culture lacking systematic preservation, ensuring the permanent archiving and dissemination of endangered cultural heritage; clarifies the cultural functions of Daur settlement spaces in collective identity building, community cohesion maintenance, and traditional knowledge transmission; provides theoretical references for understanding the role of cultural spaces in sustainable development, while offering practical insights for digital cultural preservation strategies; and enhances the visibility and accessibility of Daur culture, breaking through the communication barriers caused by remote location and economic underdevelopment. It also provides a digital content support system to address the issue of "cultural facilities being difficult to operate sustainably due to thin content."

For Research Objective 3 (Sustainable Model Design)

The output is "a series of animated short films on Douyin" (a new media cultural communication carrier). Released on social media platforms, these short videos cover the village' s unique settlement patterns, residential adaptive wisdom, cultural space functions, and tourism experience scenes, accompanied by an analytics report on their dissemination data and interaction effects.

The outcome achieves bidirectional empowerment of culture and economy: it

transforms academic research into accessible popular cultural content, making Daur settlement culture reach a wider audience; significantly enhances cultural visibility, stimulating public attention and tourist interest in Ermenqin Village; directly promotes local tourism development, activating related industries such as homestays, handicraft sales, and folk custom experiences to support community economic growth, effectively addressing the local challenge of "cultural facilities being shut down due to economic unsustainability"; constructs a sustainable development model integrating "traditional wisdom + modern communication," realizing bidirectional empowerment of cultural transmission and economic sustainability; and strengthens community cohesion by encouraging local residents to participate in cultural preservation and tourism services.

5.1.1 Research Conclusions (Based on Three Core Designs)

(1) Construction of the Physical Settlement Model: Through field surveys and spatial analysis of Ermenqin Village, a physical settlement model of Daur culture was developed. The model incorporates residential clusters, ritual spaces, handicraft workshops, and communal areas, visually representing the structural logic of "dwelling–production–belief." It serves as both a tangible preservation tool and an educational exhibit, allowing the public to experience the spatial and cultural dimensions of the Daur settlement.

(2) Online Exhibition and Cultural Sustainability: The Daur Settlement Cloud Exhibition Hall was established using digital modeling, cultural archiving, and multimedia interaction. The online platform organizes and displays endangered cultural resources, breaking the constraints of time and geography. It enables long-term accessibility and sharing of Daur heritage, contributing to the sustainable transmission of traditional culture in modern contexts.

(3) Animated Short Film and Cultural Tourism Promotion: An animated short film on Daur culture was produced and disseminated through new media platforms such as Douyin. Using visual storytelling, the film presents the spatial characteristics and everyday life of the Daur people while incorporating tourism promotion for Ermenqin Village. This digital dissemination not only enhances public engagement and cultural visibility but also stimulates local tourism and economic growth.

(4) Theoretical Contribution: The study proposes a sustainable design approach based on "Culture Identification–Reconstruction–Dissemination (CRD)", forming a theoretical and practical framework that bridges traditional wisdom with digital communication. This model contributes both theoretically and practically to the preservation, revitalization, and sustainable development of cold-region ethnic minority settlements.

5.2 Research recommendations

Based on the research results, this paper puts forward the following suggestions from four aspects: policy, architectural practice, cultural tourism and education.

5.2.1 National policy level

Residential Settlement Protection Regulations: Introduce special policies to include non-residential cultural spaces such as sacrificial sites (e.g., Obo), handicraft

workshops, and public activity areas in ethnic minority settlements into the legal protection scope, breaking the limitation of only protecting residential buildings. This can avoid the past misunderstanding of "prioritizing buildings over cultural functions" in Ermenqin Village and ensure the integrated preservation of the settlement's cultural system of "production-life-spirit".

Financial Support Mechanism Innovation: Establish a special fund with "central finance + local matching + social participation" to focus on three areas: dwelling repair, digital exhibition hall construction, and cultural communication promotion, realizing the dual preservation of "material culture + digital culture". For example: provide financial subsidies for dwelling repair to villages that complete digital cultural archiving; encourage enterprises and public welfare organizations to participate in digital cultural heritage projects, and expand funding channels through models such as "cultural IP authorization" and "public welfare crowdfunding", fundamentally solving the problems of high heating costs and facility shutdowns in Ermenqin Village homestays due to insufficient funds.

Deep Integration with Rural Revitalization Strategy: Incorporate the development of Daur settlements into the comprehensive rural revitalization strategy of "cultural tourism + ecological economy + digital innovation" to create a sustainable development model of "culture-led, economy-driven". Specifically, plan an "Ermenqin Cultural Tourism Complex" that integrates business formats such as physical settlement model display, digital cloud exhibition hall experience, folk activity participation, and ecological agriculture experience; simultaneously develop IP-derived products (such as cultural and creative figurines, digital collectibles) based on "settlement cultural genes", forming a closed loop of "cultural attraction - tourism consumption - industrial feedback - cultural protection" and completely reversing the past dilemma of "cultural facilities lacking economic support" in Ermenqin Village.

5.2.2 Recommendations for Architectural Practice

5.2.2.1 Strategies to Adopt

Natural Symbiosis Design: Prioritize the use of local materials (clay, wood, straw) and integrate passive heating methods such as U-shaped heated beds and thick walls to inherit the traditional residential wisdom of "warm in winter and cool in summer". For example, the dwellings in Ermenqin Village can retain the thermal insulation properties of thatched roofs, while incorporating modern eco-friendly coatings into the wall craftsmanship to enhance durability without compromising cultural texture.

Cultural Integrity Preservation: In planning, functional areas such as sacrificial spaces (e.g., Obo) and handicraft workshops must be retained to ensure that the spatial functions of the settlement are highly consistent with the traditional way of life. A "spatial function map" can be used to clarify the cultural attributes of each area, avoiding the problem of insufficient attractiveness of cultural facilities due to functional deficiencies, as seen in Ermenqin Village in the past.

Technology Integration and Innovation: Introduce low-energy technologies such as solar heating and digital construction records to improve living comfort without destroying the cultural texture. For example, an intelligent temperature control system can be embedded in the traditional U-shaped heated bed structure, or digital twin technology can be used to record every cultural detail of the settlement space, providing accurate basis for subsequent repair and research.

5.2.2.2 Behaviors to Avoid

Avoid Crude Material Replacement: Strictly prohibit the large-scale replacement of local materials with modern materials such as reinforced concrete, as such actions will directly destroy the cultural landscape integrity of the settlement. For example, if Ermenqin Village excessively uses cement walls in dwelling renovation, it will completely lose the cultural recognition of the Daur "loess rammed wall".

Avoid Neglecting the Value of Cultural Spaces: Do not ignore the protection value of non-residential cultural spaces such as sacrificial and handicraft areas, as they are key carriers of the settlement's integrated logic of "production-life-spirit". Be vigilant against situations like Ermenqin Village in the past, where only residential construction was focused on, while cultural spaces such as Obo declined due to lack of maintenance.

Avoid Commercial Distortion of Culture: Eliminate short-term and commercial "tourism packaging" behaviors that weaken cultural authenticity. For example, do not fabricate folk activities to attract tourists or excessively transform settlement spaces to cater to commercial aesthetics. Instead, like the Douyin short videos in this study, communication should be based on real cultural genes to ensure the purity of cultural inheritance.

5.2.3 Cultural tourism and economic revitalization

Taking the digital cloud exhibition hall, the physical model of the settlement and the short video dissemination on Douyin of this research as the core carriers, we deeply explore the integrated settlement cultural genes of the Daur people, which are

"production - life - spirit", and construct a full-chain tourism development model of "cultural display - experience immersion - consumption empowerment", achieving a two-way empowerment of cultural inheritance and economic revitalization.

5.2.4 Educational and academic dimensions

Build a "Three-Dimensional" Cultural Attraction System: Take Douyin short videos as the online traffic entry point, continuously expand the cultural influence of Ermenqin Village through visualized video narratives (such as the riverside settlement pattern, U-shaped heated bed living scenes, and Obo sacrificial rituals) to attract tourist attention; take the physical settlement model as the core offline display carrier, allowing tourists to intuitively feel the settlement's spatial wisdom and cultural logic; take the digital cloud exhibition hall as a supplement to provide a linked experience of "online virtual tour + offline check-in". Tourists can scan codes to obtain in-depth analysis of cultural elements, forming a communication closed loop of "online interest cultivation - offline experience - online sharing".

Upgrade the "Cultural Heritage + Homestay Economy" Integration Model: Promote the transformation of homestays from a pure accommodation function to a "cultural experience carrier". Integrate Daur residential wisdom (thick walls, thatched roofs, U-shaped heated beds) into homestay design and operation, allowing tourists to immerse themselves in the traditional living method of "warm in winter and cool in summer"; display handicrafts and digital cloud exhibition hall QR codes in homestays, linking with physical model displays to form a cultural experience chain of "accommodation - appreciation - cognition". At the same time, encourage villagers to participate in homestay operation and handicraft production, and enhance tourism added value through package services such as "homestay booking + handicraft customization + cultural explanation", fundamentally solving the problem of homestay shutdowns in Ermenqin Village due to lack of cultural connotations and insufficient economic benefits in the past.

Design "Immersive Cultural Experience" Featured Routes: Integrate core cultural carriers such as sacrificial spaces, handicraft workshops, and public activity spaces to create "one-day/two-day" themed experience routes. Specifically including: ① Settlement culture exploration: Villager guides lead visits to the physical settlement model, conduct on-site tours of Obo and public activity spaces, and explain the spatial logic of "houses built along the river and central axis layout"; ② Traditional life experience: Experience U-shaped heated bed heating in homestays, taste Daur characteristic cuisine, participate in handicraft production (such as traditional weaving,

leather processing), and personally feel the application wisdom of local materials; ③ Ritual culture participation: Organize tourists to participate in collective rituals during important folk festivals (such as Spring Festival, Obo Sacrifice Festival) to deepen their understanding of the Daur "spiritual life". Through multi-dimensional experiences of "seeing, listening, doing, and feeling", tourists are transformed from "sightseers" to "participants in cultural inheritance", enhancing tourism stickiness and word-of-mouth communication power.

Create a Value-Added Chain of "Cultural IP + Cultural and Creative Industry": Develop a series of cultural and creative products based on the settlement cultural genes identified in the research (such as central axis spatial layout, U-shaped heated beds, Obo symbols). Including physical cultural and creative products (such as mini figurines of settlement models, handicraft material packages, folk theme accessories) and digital cultural and creative products (such as cultural element emoticons, digital collectibles, online interactive games); at the same time, set up cultural and creative sales points in homestays and physical model exhibition areas, and guide traffic through Douyin short video live streaming and cloud exhibition hall links online, forming a value-added chain of "cultural IP incubation - cultural and creative development - online and offline sales". This transforms cultural resources into sustainable economic benefits, feeding back settlement protection and community development.

5.2.4 Construction of Educational Communication and Intergenerational Inheritance System

Based on the physical model of the settlement, the digital cloud exhibition hall and the research results of cultural genes in this study, a three-in-one education communication system of "academic education - basic education - community participation" is constructed to promote the intergenerational inheritance and innovative development of the wisdom of the Daur settlement.

Penetration into Academic Education System: Incorporate the Daur settlement wisdom into the curriculum systems of architecture, anthropology, and ethnology, and offer a special course titled "Spatial Wisdom of Cold-Region Ethnic Settlements".

University-Community Collaborative Co-construction: Encourage university faculty and students to participate in community co-construction projects in Ermenqin Village. For example, launch the "College Student Cultural Maker Village Residency Program", where faculty-student teams collaborate with villagers to develop cultural and creative products themed on settlement culture, plan folk activities, and optimize tourism routes; establish a "campus-community" cultural preservation collaboration model, where universities provide cultural research and digital technical support for the community, and the community provides field research and practical teaching bases for universities, forming a virtuous cycle of bidirectional empowerment. Through diverse initiatives such as curriculum development, practical teaching, digital education promotion, and university-community cooperation, a multi-level cultural inheritance

mechanism involving multiple stakeholders such as scholars, faculty-students, villagers, and students is constructed, providing sustained momentum for the protection and sustainable development of traditional wisdom in cold-region ethnic settlements.

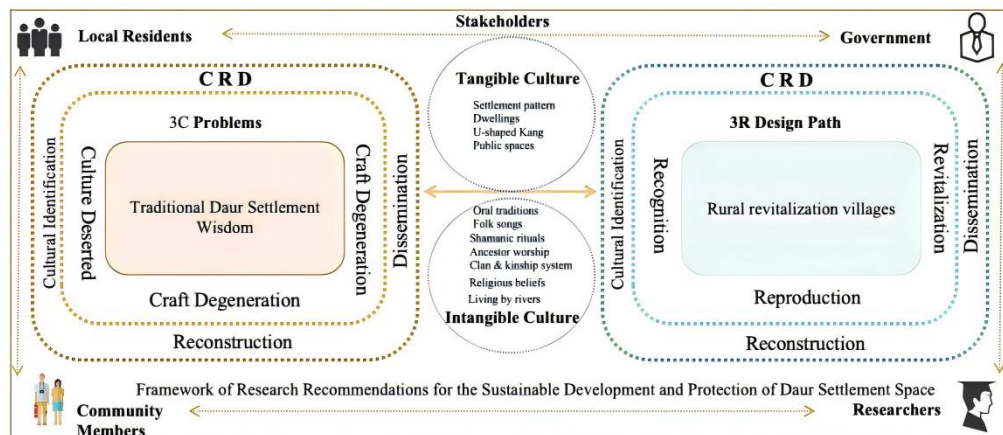


Figure 138 Design model of sustainable development and protection of Daur settlement space

5.2.5 Daur Sustainable Development Model

Based on the three design outcomes — the Physical Settlement Model, the Cloud Exhibition Hall, and the Animated Short Film, this study proposes the Daur Sustainable Development Model, aiming to integrate cultural preservation, public communication, and local economic revitalization.

The model operates through a threefold cycle of cultural sustainability, economic sustainability, and social participation, forming a dynamic system that connects cultural dissemination with community development. The operational mechanism is as follows:

1. **Cultural Content Production:** The spatial wisdom, ritual practices, and intangible heritage of the Daur people are transformed into communicable content through academic research, digital exhibitions, and animated storytelling.

2. **Media Dissemination and Public Engagement:** Through platforms such as Douyin and WeChat, the content reaches wider audiences, encouraging public interest and tourist participation.

3. **Tourism Promotion and Economic Growth:** The integration of online exposure and offline tourism activities promotes local homestays, handicrafts, and specialty sales, generating steady income for the community.

4. **Youth and Community Cycle:** Young villagers participate in digital exhibitions, video production, and creative industries, strengthening cultural identity and skill development, and ensuring the intergenerational transmission of Daur heritage.

Under the coordination of the Ermenqin Village Government Office, the model builds a synergic framework linking cultural dissemination, community engagement, and economic growth, representing a practical pathway toward the

sustainable revitalization of cold-region ethnic settlements.

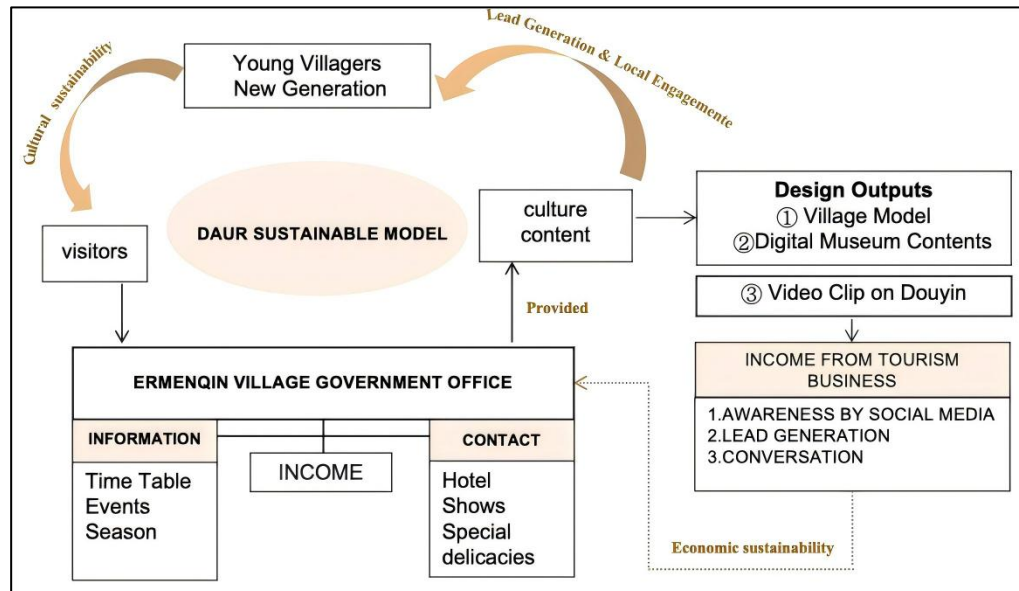


Figure 139 Daur sustainable model

5.3 Future Research Prospects

Future research will further refine and apply the Daur Sustainable Development Model proposed in this study. Through the three design outputs — the physical settlement model, online exhibition hall, and animated short film — the study has built a complete chain from cultural recording to dissemination and local economic engagement. Based on this foundation, future studies can develop in the following directions:

5.3.1 Cross-cultural Comparison

Future research may conduct comparative studies with other ethnic villages in Heilongjiang that share similar climates and traditions. By comparing architectural forms, living styles, and cultural inheritance, researchers can identify common patterns and differences.

Significance: This comparison helps to test and improve the model's adaptability to different regional contexts, providing more practical guidance for cold-region settlement preservation.

5.3.2 Digital Innovation Expansion

Building on the existing digital exhibition and short videos, future work can explore more interactive formats such as virtual tours, audio guides, and AR-based experiences to enhance visitor engagement and cultural learning.

Significance: Digital innovation allows Daur culture to be presented more vividly and accessibly, supporting its use in education, tourism, and community promotion.

5.3.3 Social and Economic Impact Tracking

Future studies can continue to monitor data such as online exhibition traffic, video engagement, tourist flow, and homestay income to analyze how cultural promotion contributes to local economic growth.

Significance: Long-term monitoring helps evaluate the real effect of the culture–tourism–economy cycle, providing useful feedback for local policy and community improvement.

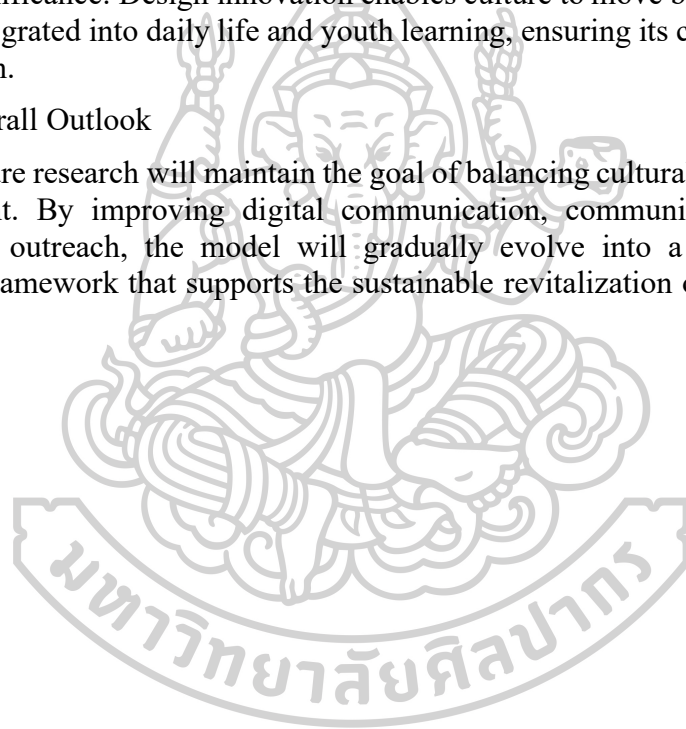
5.3.4 Design-derived Innovation

Future research can also focus on creative extensions of Daur culture, such as cultural workshops inspired by the kang system or handicrafts based on settlement symbols, making traditional culture a living part of community and education.

Significance: Design innovation enables culture to move beyond exhibition and become integrated into daily life and youth learning, ensuring its continued vitality and transmission.

Overall Outlook

Future research will maintain the goal of balancing cultural protection and local development. By improving digital communication, community engagement, and educational outreach, the model will gradually evolve into a more practical and adaptable framework that supports the sustainable revitalization of cold-region ethnic settlements.



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APPENDIX

Loc expert:

Expert Name	Position/Title	Field of Expertise	Evaluation of Research Content	Personal photo
Pan Lei	Ph.D., Kasetsart University (Thailand)	Translation and Intercultural Studies	The questionnaire design is reasonable, and the content is comprehensive. It effectively reflects the current state and cultural protection needs of the Daur settlement	
Guan Xiaoyi	Ph.D., Deakin University (Australia)	Architecture and Built Environment	The research method is scientific and rigorous, and the content is comprehensive, which provides a solid basis for the development strategy in the field of architectural protection	
Han Chunyu	Associate Dean, School of Fine Arts and Art, Jiamusi University Deputy Secretary-General, Jiamusi	Fine Arts Major	Through in-depth analysis of Daur art and culture elements, this study provides a new perspective and method of cultural inheritance and innovation, enriching the theoretical basis of art design and guiding practical application	

Index of Item Objective Congruence (IOC) from three experts result are as followed:

Part 1:

No.	Expert1			Expert2			Expert3			Total Scores Σ	IOC $\frac{\Sigma R}{N}$	Data Analysis
	-1	0	1	-1	0	1	-1	0	1			
Q1			√			√			√	3	1	Acceptable
Q2			√			√			√	3	1	Acceptable
Q3			√			√			√	3	1	Acceptable

Part 2:

No.	Expert1			Expert2			Expert3			Total Scores Σ	IOC ΣR — N	Data Analysis
	-1	0	1	-1	0	1	-1	0	1			
Q1			√			√			√	3	1	Acceptable
Q2			√			√			√	3	1	Acceptable
Q3			√			√			√	3	1	Acceptable
Q4			√			√			√	3	1	Acceptable
Q5			√			√			√	3	1	Acceptable
Q6			√			√			√	3	1	Acceptable
Q7			√			√			√	3	1	Acceptable
Q8			√			√			√	3	1	Acceptable
Q9			√			√			√	3	1	Acceptable
Q10			√			√			√	3	1	Acceptable
Q11			√			√			√	3	1	Acceptable
Q12		√				√			√		1	Acceptable

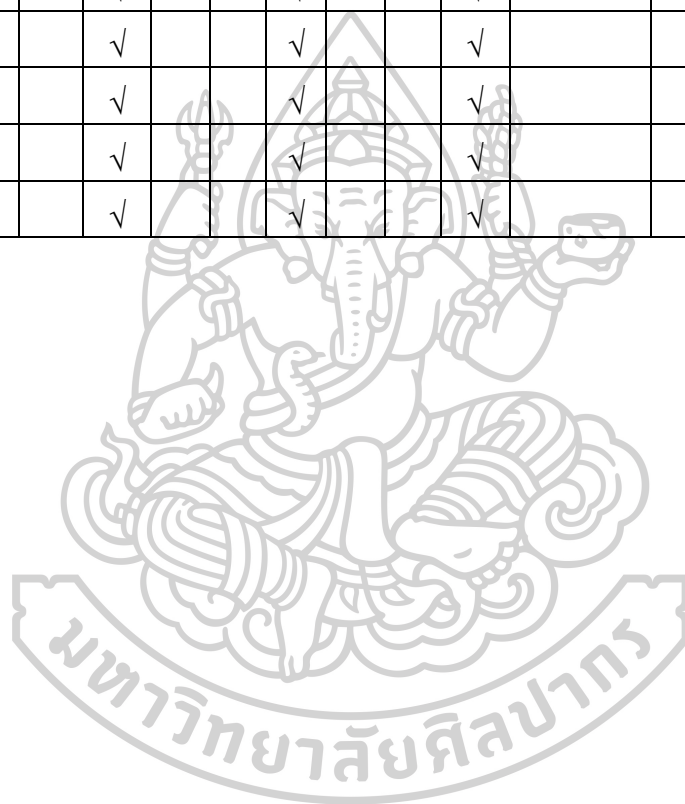
Part 3:

No.	Expert1			Expert2			Expert3			Total Scores Σ	IOC $\frac{\Sigma R}{N}$	Data Analysis
	-1	0	1	-1	0	1	-1	0	1			
Q1			√			√			√		1	Acceptable
Q2			√			√			√		1	Acceptable
Q3			√			√			√		1	Acceptable
Q4			√			√			√		1	Acceptable
Q5			√			√		√			0.6	Acceptable
Q6			√			√			√		1	Acceptable
Q7			√			√	√				0.3	Reject
Q8			√			√			√		1	Acceptable
Q9			√			√			√		1	Acceptable
Q10			√			√			√		1	Acceptable



Part 4:

No.	Expert1			Expert2			Expert3			Total Scores Σ	IOC ΣR — N	Data Analysis
	-1	0	1	-1	0	1	-1	0	1			
Q1			√			√			√		1	Acceptable
Q2			√			√			√		1	Acceptable
Q3			√			√			√		1	Acceptable
Q4			√			√			√		1	Acceptable
Q5			√			√			√		1	Acceptable
Q6			√			√			√		1	Acceptable



VITA

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2008-2015 QiQihaer University,.HeiLongjiang, China.

1. Yina Qiao & Phuvanart Rattananungsikul. (2025). The traditional building technology against cold and its cultural significance of Daur. Journal of Wisdom in Political Science and Multidisciplinary Sciences, Vol. 8, Issue 3, May–June 2025.

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